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**UNITED STATES DISTRICT COURT
NORTHERN DISTRICT OF CALIFORNIA
OAKLAND DIVISION**

EPIC GAMES, INC.,

Plaintiff, Counter-defendant,

v.

APPLE INC.,

Defendant, Counterclaimant.

Case No. 4:20-cv-05640-YGR-TSH

FINDINGS OF FACT AND CONCLUSIONS OF LAW PROPOSED BY EPIC GAMES, INC.

The Honorable Yvonne Gonzalez Rogers

Trial: May 3, 2021

1 Epic Games, Inc. respectfully proposes the Findings of Fact and Conclusions of
2 Law submitted herewith.

3 Dated: May 28, 2021

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Findings of Fact

Note: (i) Yellow highlighting quotes or reproduces materials that the Court has ordered sealed in a prior order or that are subject to a sealing request; (ii) blue highlighting indicates materials that are subject to the pending motions at Dkt. Nos. 602, 657 or 721; and (iii) green highlighting reflects materials that are subject to both (i) and (ii).

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I. INTRODUCTION.

1. This case is about Apple’s conduct to monopolize two markets within its iOS ecosystem: (i) the iOS App Distribution Market; and (ii) the iOS In-App Payment Solutions Market. To understand those markets and Apple’s conduct within those markets, it is important to understand Apple’s iOS ecosystem.

2. The foundation of this ecosystem is the iPhone’s mobile operating system, called “iOS”. (DX-4581.4.)

3. iOS grew out of Apple’s macOS operating system (formerly known as Mac OS X), versions of which have been on Apple’s Mac computers since the early 2000s. iOS traces its roots back to the introduction of the iPhone in 2007. (*See* Section II below; *see also* Ex. Depo. 4 at 37:23-38:1, 64:19-21, 81:2-84:6 (Forstall); PX-880.10.)

4. Since the introduction of iOS in 2007, Apple has developed myriad services and features that tie together all Apple products to create an Apple “ecosystem”, but that are not compatible with devices running on other operating systems outside of the Apple ecosystem. As Apple has added more features and more devices that can interact with iOS, the reach and hold that iOS has on consumers’ lives has grown. (*See* Sections II.A-II.B below.)

5. As a result, consumers—and often their households—become locked in to iOS, with high switching costs and decreased ability and willingness to extract themselves from the iOS ecosystem. (Athey Trial Tr. 1754:16-18, 1769:22-1770:22, 1792:13-24; *see also* Section II.B below.)

6. These switching costs run the gamut, from time, to financial costs associated with reacquiring digital content, to learning a new operating system, and to the frustration and complexity associated with having a device that is incompatible with a user's remaining devices or the devices of friends and family members who remain on iOS. As one of Apple's executives put it: "Who leaves Apple products once they've bought apps, music, movies, etc!" (PX-404.1; Ex. Depo. 3 at 67:13-19; 68:1-13 (Cue); *see also* Section II.B below.)

7. While these features designed by Apple may be responsible for the lock-in, they are not what drew most users to the iOS ecosystem in the first place. Rather, the success of the iOS ecosystem stemmed from the combination of Apple's iPhone with iOS and with a world of software created by developers whose ingenuity, creativity and dedication has led to an array of apps that provide ever-more functionality to users within the iOS ecosystem. (*See* Section II.E below.) As Apple's iconic commercial noted, whatever a user wanted to do with her iPhone, "there's an app for that!" (PX-2065.1.)

8. Developers of apps cannot reach users of iOS devices without writing apps specifically for iOS; native apps written for other operating systems do not work on iOS, and non-native apps, such as apps delivered over a web browser, are no match for native apps created specifically for iOS devices. (*See* Sections III.K-III.M below.)

9. In the fall of 2007, Apple recognized the need to allow third parties to develop native apps for iOS to help attract new users and grow the iOS ecosystem. In March 2008, Apple announced the release of software tools for developing iOS apps and the upcoming launch of the App Store. (*See* Section II.D below.)

10. The relationship between Apple and the developer community is, in some ways, synergistic. Apple develops iOS, and app developers design apps that deploy iOS to do wonderful, amazing, useful and fun things. Appealing devices, with appealing functionality, result in consumer adoption. A device that has great potential, but not great functionality, is of limited use to consumers. (*See* Section II.D-II.E below.) Apple has acknowledged that “[a]n ecosystem including third party apps made our products more attractive”. (PX-314.5.)

11. That synergy, however, does not result in a level playing field. As Apple has gathered more and more users into its ecosystem and locked them in, the importance of the Apple ecosystem to developers has increased to the point that nearly all developers rely on Apple—but Apple does not need to rely on any single developer. (*See, e.g.*, Sections II.C and IV below.)

12. Although Apple had other options, and debated them internally as a “policy” matter, at the same time it decided to allow third parties to develop apps for iOS users, in 2008, Apple chose to make the newly created App Store the exclusive means of distribution of all apps on iOS. (*See* Section II.D below.)

13. Apple requires all app developers that wish to have their apps available on an iOS device to enter into non-negotiable contracts that establish the terms and conditions of their relationship. (*See* Section IV.257 below.) Under these contracts, app developers are subject to a variety of restrictions related to distribution:

- a. Developers must submit all their apps and app updates for review by Apple, and await Apple’s determination as to whether to

- approve or reject their app, which Apple makes in its sole discretion (PX-2619.16 (DPLA) § 3.2(g); *see* Section XI.F below);
- b. Apple may delist developers' apps from the App Store at any time (PX-2943 (Schedule 2) § 7.3);
 - c. Developers cannot offer their own app store on iOS devices (PX-2619 (DPLA) § 3.3.2); and
 - d. Other than specified exceptions, developers cannot allow users to access content, subscriptions or features they purchased through another app distribution channel, such as the developer's own website, without also selling it in the App Store (PX-2619 (DPLA) § 3.3.3.).

14. As a result of these restrictive policies, the App Store is the only place for iOS users to obtain and developers to distribute apps, for the range of tasks and activities users may want to do on iOS devices, such as banking, navigation, gaming, watching videos, social networking, and finding friends or romantic partners. (*See, e.g.*, Section **Error! Reference source not found.** below.)

15. The App Store started out with only 500 apps. (Fischer Trial Tr. 928:14; Cook Trial Tr. 3860:20-21.) That number grew to over 75,000 after one year. (Schiller Trial Tr. 2845:16-21.) Today, the App Store contains 1.8 million apps. (Fischer Trial Tr. 928:14-15; Cook Trial Tr. 3860:20-22.)

16. Apple has long exercised monopoly power over app distribution on iOS.

The App Store's extraordinary profit margins clearly evidence this fact. Apple's internal presentations have calculated the App Store's profit margins to be nearly [REDACTED] in the last few years, [REDACTED]. (Sections II.F, IV.C below.)

17. Apple's choice to make the App Store the exclusive means for distribution of iOS apps was a business decision; it was not necessary to ensure the security of the iOS ecosystem. (*See, e.g.*, Section XI below.)

18. Notably, Apple made—and continues to make—a different business decision on the macOS operating system, which runs on Apple's Mac computers. On macOS, Apple allows developers to distribute their apps outside of Apple's own app store. macOS is a template of an open platform that (until this litigation, when it suddenly changed its tune) Apple itself has held out to the world as secure—a place where users can download apps from the App Store or from other sources “worry free”. (*See Section Error! Reference source not found.* below.)

19. The security of iOS is derived primarily from the operating system itself and the hardware on which it runs. Indeed, iOS was modeled after macOS and inherited many of its core architectural features. But iOS offers even more robust operating system-based security mechanisms. Apple could easily implement security features to support open distribution on iOS without restricting app distribution to the App Store, just as it does with macOS. (*See Section XI.E below.*)

20. Apple points to its App Review process and asserts that there are security benefits that flow from funneling all apps through the App Review process, but that is pretextual. (See Section **Error! Reference source not found.** below.) Apple’s App Review process does little to keep iOS devices secure. It is cursory and has historically lagged behind the state of the art in terms of use of the automated tools needed for robust security checks. Many apps that should have been rejected under Apple’s own guidelines have been approved, and apps that should have been approved have been rejected. Developers have faced an inefficient and opaque app review process riddled with arbitrary decisions and errors coupled with poor customer service. (See Sections **XI.F-Error! Reference source not found.** below.)

21. Moreover, the manual portion of Apple’s App Review process screens primarily for non-security issues—including specifically for anti-competitive purposes. For example, Apple has used the App Review process to reject competitive threats even when the apps complied with Apple’s then-prevailing guidelines. And Apple has used App Review to preference its own apps over competing third-party apps to the detriment of consumers and developers. (See Sections **Error! Reference source not found.** below.)

22. There is nothing security-related about Apple’s App Review process that Apple could not continue to do if distribution were open—similar to what Apple does on macOS today through a process it calls “notarization”—or that could not be replicated or even improved upon by third parties. Put simply, Apple has no security reason for restricting iOS app distribution to the App Store. Indeed, Apple has never even analyzed whether any other app stores would introduce security problems to the iOS platform. (See, e.g., Section XI.I below.)

23. Not only is exclusive distribution through the App Store neither designed to nor essential to ensure security, but also Apple’s restrictions on app distribution degrade the experience of consumers and developers. Excluding competing app stores from the iOS ecosystem has resulted in higher app prices, less innovation and fewer features for both developers and consumers. And Apple’s arbitrary App Review process is ripe for abuse. (*See* Parts V, VIII below.) The safety of iOS users is also not dependent on Apple’s restrictive policies. To the contrary, Apple’s policies have actually harmed user safety because, by refusing to loosen its stranglehold on consumers and their data, Apple refuses to help developers with even the most basic safety features, such as running registered sex offender checks or verifying users’ ages. (*See* Section VIII.E below.)

24. As some developers’ business models evolved from selling apps up front to providing apps free to download and offering content for purchase within the app, Apple adapted its business model, as well, by adding a new restriction. Between the launch of the App Store and 2009, an array of developers developed their own functionality that permitted their users to make purchases from within their apps. In 2009, Apple introduced the In-App Purchase (“IAP”) system—a payment solution that Apple *required* all developers selling in-app digital content to use and that carried with it an automatic deduction of a 30% commission from all such in-app purchases of digital content. Later still, in 2011, Apple expanded the reach of IAP to cover subscriptions. (*See* Section II.F below.)

25. Apple’s price hikes have closed the door on many developers who wish to enter the iOS ecosystem. Some small businesses cannot afford to absorb Apple’s 30% fee and

would lose business if they passed it on to their customers. As Apple's founder Steve Jobs acknowledged, Apple's commission "is prohibitive for many things". (PX-438.1.)

26. Of course, some developers have chosen to pass on part of Apple's 30% fee to consumers. For that reason, Apple's conduct has caused consumers to pay higher prices for apps and in-app content. (*See* Part VIII below.)

27. The App Store and IAP are not technologically integrated. The App Store was created and existed for some time without IAP, and it still exists apart from IAP. (*See* Section **Error! Reference source not found.**) While Apple requires the use of IAP for the purchase of in-app digital content, Apple does not require the use of IAP for in-app purchases of physical goods and services made from iOS apps, such as Amazon purchases or Uber rides. (*See, e.g.*, Section VI.B below.)

28. Rather than technological, Apple's requirement that all in-app purchases of digital goods use Apple's IAP is contractual. The IAP requirement is simply a tool for Apple to collect its outsized commission. (*See* Section VI.D below.) Specifically, under the same non-negotiable contracts discussed above, app developers are subject to a variety of restrictions related to IAP:

- a. They must use Apple's In-App Purchase system for digital in-app purchases and may not include an alternative payment solution within the app (PX-2790 (App Store Review Guidelines) § 3.1.1);
- b. They cannot steer users to alternative payment methods outside the app: "Apps and their metadata may not include buttons, external

links, or other calls to action that direct customers to purchasing mechanisms other than in-app purchase” (PX-2790 (App Store Review Guidelines) § 3.1.1);

c. Starting with the operative version of the Guidelines (those issued in March of 2021 and in evidence as PX-2790), Apple began imposing even more onerous and suffocating anti-steering provisions on developers. (Trial Tr. 4147:1-25; PX-2790 (Guidelines) § 3.1.3.) These broad, newly added restrictions go beyond the above-described prohibitions on links and calls to action within the app which existed in previous iterations of the Guidelines. Specifically, the new Guidelines also contain additional broad anti-steering language that applies to developers that offer multi-platform apps. (Trial Tr. 4147:1-25; PX-2790 (Guidelines) § 3.1.3.) The new Guidelines prevent such developers from marketing non-App Store purchase alternatives to consumers using any of the information that they obtain from their own customers when customers sign up for an account for the developer’s app on iOS. (Trial Tr. 4147:1-25; PX-2790 (Guidelines) § 3.1.3 (prohibiting developers from “encouraging users to use a purchasing method other than in-app purchase”

“either within the app or through communications sent to points of contact obtained from account registration within the app.”)

- d. They must allow Apple to collect a 30% commission on the sale of paid apps (PX-2943.3-5 (Schedule 2) § 3.4);
- e. They must allow Apple to collect a 30% commission on digital in-app purchases including subscriptions (with a 15% commission on subscriptions after the first year) (PX-2943.3-4 (Schedule 2) § 3.4(a));
- f. They may not mention the commission paid to Apple anywhere in the app (Ex. Depo. 2 at 144:10-23 (Shoemaker)); and
- g. They must price their app within global pricing tiers set by Apple. (Ex. Depo. 9 at 266:12-15 (Fischer)).

29. As with Apple’s contractual requirement that apps be distributed exclusively through the App Store, Apple’s decision to require apps to use IAP was a business decision. It was meant to capture revenue, not to create security benefits. Apple’s assertion to the contrary is pretextual. (*See* Part XII below.)

30. As noted above, before Apple imposed its IAP requirement in 2009, non-IAP payment methods were used by some developers to process payments for digital content. Apple has no evidence that using those methods for those apps created any security issues. And Apple continues to permit non-IAP payment methods for various categories of apps. Apple has

no evidence that the non-IAP payment methods in these apps have caused security issues. (*See Part XII below.*)

31. There are many third-party payment processors available for developers, including PayPal, Chase, Square and Stripe, just to name a few. They are trusted partners of thousands of companies, including Grubhub, Wish, StubHub, Uber, DoorDash, Lyft, Instacart, Postmates, Amazon Shopping, Walmart, eBay, Amazon Prime Video, Altice One, and Canal+. (*See Ex. Expert 1 (Evans) ¶¶ 235, 238.*) Apple itself contracts with PayPal and Chase as part of the IAP process. (Ex. Depo. 12 at 75:12-19, 78:23-25, 79:3-8, 79:10-15 (Gray).) (*See Section XII below.*)

32. Apple's requirement that its IAP solution be inserted in the relationship between developers and these third-party payment processors does not ensure security. To the contrary, third-party payment processors may provide even better security than Apple. They have multi-platform datasets that detect fraud better than Apple can through IAP. Security could also be a vector on which third-party payment processors compete and innovate, leading to better security for everyone. (*See Part XII below.*)

33. Not only is Apple's IAP requirement neither designed nor essential to ensuring security on iOS, but also Apple's IAP requirement results in significant decreases in quality to consumers and developers. It interferes with the relationship between developers and their customers, from forcing developers to rely on Apple for resolving transactional disputes, to processing refunds, to preventing developers from obtaining data and metrics about their

customers to improve user experience and safety, and to reducing customer choice for more flexible payment options. (*See* Part VIII below.)

34. Apple also attempts to justify its restrictions and exclusionary conduct on the basis that it is entitled to compensation for its investments in iOS, but that too is pretextual. (*See, e.g.*, Sections II, X and XI below.)

35. Apple monetizes iOS through myriad ways, the primary of which is the sale of iOS hardware, such as iPhones. Apple launched iOS and the iPhone without any plan even to offer an app store, let alone one that is an independent profit center. To the contrary, when the App Store launched in 2008, Steve Jobs, Apple's founder, said that Apple's 30% commission was to "pay for running the App Store". (PX-880.21; Ex. Depo. 4 at 161:20-162:4, 162:5-12, 163:14-164:3 (Forstall).) Mr. Jobs was asked specifically to address the concern of developers about Apple's decision to make the App Store the exclusive distribution channel of apps on iOS, and he promised developers they had nothing to worry about because "just to make it a little clearer, **we don't intend to make money off the App Store . . . we are basically giving all the money to the developers here**". (PX-880.27 (emphasis added).) Mr. Jobs never suggested Apple needs App Store revenue to sustain development of iOS.

36. In addition to the more than [REDACTED] in annual operating profits that Apple earns from the sale of iPhones and iPads (Evans Trial Tr. 1730:21-25; PX-606); it also charges app developers fees to be part of Apple's Developer Program and write iOS apps for distribution on iOS devices; it charges developers for support services, if they need them (Ex. Depo. 5 at 31:12-15, 32:6-7 (Haun)); and it makes [REDACTED] more from developers by auctioning

off prominent listing of developers' apps when users search for apps within the App Store. (*See Sections II.F, IV.C below.*)

37. If Apple's conduct is sanctioned by the antitrust laws, little would stop Apple from abusing its monopoly power in even more extreme ways. Apple's position is that, as an economic matter, Apple can monetize virtually any transaction involving the iOS platform—including the in-app purchase of physical goods, any revenue generated through advertising, and even “transactions that take place on the Safari browser” through websites accessed on an iOS device. According to Professor Richard Schmalensee, Apple's lead economist, “as an economic matter, the only things that are preventing Apple from [imposing a fee on these transactions] are competition, or the possibility of competition, and people's willingness to pay”. (Schmalensee Trial Tr. 1988:15-1989:7.) [REDACTED]

[REDACTED]
[REDACTED]
[REDACTED]

38. Apple would continue to have a strong incentive to invest in the iOS ecosystem even without its monopoly on in-app payment solutions. All successful platform providers make developer tools widely available to attract third-party developers. Given the many contributions of third-party developers to the iOS ecosystem, Apple will continue to invest in and make widely available its developer tools because doing so enhances the value of iPhones. (*See Section II.E below.*)

39. Epic Games, Inc. (“Epic”) has suffered harm from Apple's conduct. (*See Section IX below.*)

- a. Epic has an app store, the Epic Games Store, that it has launched on personal computers (“PCs”) and Macs. Epic would launch the Epic Games Store on iOS if it could, but Apple will not allow it to do so. If the Epic Games Store were on iOS, it would provide consumers with the benefits of competition in iOS app distribution.
- b. Absent Apple’s rules, Epic would not distribute its apps through the App Store. (Sweeney Trial Tr. 97:24-98:4 (“[O]ur Epic Games Store business is harmed by Apple’s policies because we are barred from introducing a version of our store for iOS. So we can operate on PC and Mac, but we cannot, because of Apple’s policies, distribute apps on iOS, and that locks us out of a very large worldwide business we would love to be in.”).) Instead, Epic would distribute its apps through other means, including from its website and through EGS. (Sweeney Trial Tr. 97:25-98:4.) By distributing its apps through the App Store, Epic has paid supra-competitive commissions and been deprived of the benefits that would flow from a competitive market. (Sweeney Trial Tr. 92:8-13; Evans Trial Tr. 1550:7-14 (Apple’s anticompetitive conduct in the iOS App Distribution Market has caused “higher prices”, “less and poorer distribution services” and a “slower pace of innovation”.).)

c. Epic has its own payment processing functionality—Epic direct payment. Apple forbids Epic from using Epic direct payment on iOS, depriving Epic’s customers of payment choices that would allow Epic to offer lower prices and comprehensive customer service. (Sweeney Trial Tr. 128:13-129:4.)

40. In addition, many other app developers have also been harmed by Apple’s practices, several of which have come forth to provide testimony in this case. (*See* Part VIII below.)

- a. There are app developers that are unable to innovate and produce products because of Apple’s practices. (*See, e.g.*, Ex. Depo. 1 at 65:15-17; 65:19-66:4 (Ong).)
- b. There are app developers that cannot offer safety features to users because of Apple’s practices.
- c. There are app developers that cannot financially survive because of Apple’s practices, depriving customers of their offerings altogether.

II. BACKGROUND – APPLE AND ITS ECOSYSTEM

A. Apple’s Business.

41. The Court takes judicial notice of the fact that Apple is the largest company in the world by market capitalization, with a market cap of over \$2 trillion. (See Jessica Bursztynsky, *Apple Becomes First U.S. Company to Reach a \$2 Trillion Market Cap*, CNBC (Aug. 19, 2020), <https://www.cnbc.com/2020/08/19/apple-reaches-2-trillion-market-cap.html>.)

a. “Information about the stock price of publicly traded companies [is] the proper subject of judicial notice.” *In re Facebook, Inc. Sec. Litig.*, 405 F. Supp. 3d 809, 828 (N.D. Cal. 2019).

42. Apple is headquartered in Cupertino, California, and employs approximately 147,000 full-time equivalent employees worldwide. (DX-4581.7, 18.)

43. Apple launched the iPhone in 2007. (Schiller Trial Tr. 2719:8-9; DX-3426.1; Cook Trial Tr. 3849:12.)

44. Smartphones require an operating system (“OS”) to function. Among other things, an OS makes decisions about how a device’s hardware resources are shared across different apps, coordinates activities among those apps and enforces security mechanisms to prevent those apps from interfering with the proper operation of the device. (Sweeney Trial Tr. 132:6-15; Grant Trial Tr. 663:13-17; Ex. Expert 5 (Mickens) ¶¶ 7, 21-23.)

45. The iPhone runs on a mobile operating system called “iOS”. (DX-4581.4.)

46. iOS is based on the operating system previously developed for the Mac: macOS (specifically, Mac OS X). (Ex. Depo. 4 at 64:19-21 (Forstall); PX-880.8, .10; *see also* Federighi Trial Tr. 3358:9-14.)

47. Today, there are over 1 billion active iPhone users worldwide. (Federighi Trial Tr. 3362:2-3 (“Well, the iOS ecosystem is quite popular at this point. There are well over a billion active devices out there.”).)

48. In fiscal year 2019 alone, Apple earned roughly \$142.4 billion in net sales and \$ [REDACTED] in operating profits from the sale of iPhones. (PX-606; DX-4600.022.) Similarly, it earned approximately \$163.6 billion in net sales from the combination of iPhones, and iPads. (PX-606; DX-4600.022.)

49. In addition, Apple develops iPads, which are based on the iPadOS operating system.¹ Historically, iOS was also the operating system used on iPads, but Apple subsequently announced that it would begin using the name iPadOS to refer to the operating system on iPads. (Fischer Trial Tr. 873:25-874:1, 874:18-19; Federighi Trial Tr. 3357:16-17.)

50. Apple also develops wearables, home products and accessories, including AirPods, Apple TV, Apple Watch, Beats headphones, HomePod, iPod touch and other Apple-branded products, which it sells together with various third-party accessories online and in retail stores. (Fischer Trial Tr. 874:3-15; DX-4581.4-5.)

¹ For simplicity’s sake, this document refers to the operating system on both devices as “iOS”. There are no differences between iOS and iPadOS that are relevant to the facts herein.

51. These devices and services together comprise the Apple “ecosystem”.
(Fischer Trial Tr. 874:9-875:11.)

52. Apple devices, software, and services in this ecosystem are designed to operate “seamless[ly]” with each other. (PX-1932.6; PX-405.1; Athey Trial Tr. 1791:21-1792:13.)

53. Apple’s core business model is to get its users “hooked to” this integrated Apple ecosystem. (PX-404.1.) To that end, Apple monitors [REDACTED]

[REDACTED]

[REDACTED] *see also* [REDACTED]

[REDACTED]

54. To keep users repeatedly coming back to Apple’s offerings, Apple has worked to “build” its App Store and other services “as far into the iPhone OS experience as possible”. (PX-403.1; Ex. Depo. 3 at 64:3-4, 64:7-12, 65:13-18 (Cue).)

55. In fact, senior Apple executives recognized that “[g]etting customers using our stores (iTunes, App and iBook store) is one of the best things we can do to get people hooked to the ecosystem”. (PX-404.1; Ex. Depo. 3 at 68:1-13 (Cue).)

56. In an agenda for a 2010 executive team meeting, Apple founder and late CEO Steve Jobs wrote that he wanted to “tie all of our products together, so [Apple] further lock[s] customers into [its] ecosystem” and “make [the] Apple ecosystem even more sticky”. (PX-892.1-2.) Mr. Jobs’ plan worked.

- a. The notes from this meeting were about Mobile Me, a precursor to what is now iCloud. (*See* Schiller Trial Tr. 2865:17-21.)
- b. Mr. Schiller later wrote to other Apple executives that iCloud “figure[s] pretty big in the ability and effort involved [for customers] to switch [from iPhone to Android].” (PX-80.1; Schiller Trial Tr. 2955:10-1956:14.)

57. Apple has developed a number of apps, services and features that enhance “lock in” into the Apple ecosystem. iMessage (used in the Messages app), “Find My Friends” and “Continuity” are a few examples, all discussed below. As Apple has developed, updated and released its own apps over time, it has built them “as far into the iPhone OS experience as possible.” (PX-403.1.)

58. Messages is a particularly “sticky” Apple app. It allows for seamless messaging and multimedia communications across Apple iPhones, iPads and Macs. (PX-416; Ex. Depo. 3 at 114:14-115:2 (Cue); Schiller Trial Tr. 3171:13 (“iMessage is a communications service that Apple runs.”).)

59. Consumers have come to rely on the ability to iMessage each other on iOS devices. If an iPhone user attempts to send a text message to the user of a non-Apple device (such as an Android phone), iMessage transmits the message as a standard cellular text (called an SMS), meaning both users are deprived of the features uniquely associated with iMessage, including encryption of the message contents. (Schiller Trial Tr. 3172:4-3173:9.) Apple prominently reveals to iOS users whether they are exchanging messages with someone who

owns an iOS device: iMessages appear in blue bubbles, and standard text messages appear in green bubbles. (Schiller Trial Tr. 3173:11-16.)

60. Apple has recognized the power that iMessage has to attract and keep users within its ecosystem.

- a. As early as 2013, Apple decided not to develop a version of iMessage for the Android OS. (Ex. Depo. 3 at 91:17-20, 91:22-92:09, 92:11-12, 92:18-93:1 (Cue).)
- b. Mr. Cue testified that Apple “could have made a version on Android that worked with iOS” such that there would “have been cross-compatibility with the iOS platform so that users of both platforms would have been able to exchange messages with one another seamlessly”. (Ex. Depo. 3 at 92:5-9, 92:11-16 (Cue).)
- c. However, Craig Federighi, Apple’s Senior Vice President of Software Engineering and the executive in charge of iOS, feared that “iMessage on Android would simply serve to remove [an] obstacle to iPhone families giving their kids Android phones”. (PX-407.1; Ex. Depo. 3 at 96:7-11, 97:8-12 (Cue).)
- d. Mr. Schiller, an Apple executive in charge of the App Store, agreed that Apple should not offer iMessage on Android devices. (PX-408.1 (“iMessage was created as a feature of iOS that brings value to our iPhone users. It makes no revenue and is funded by

our product margins. The idea that we should now get into the messaging business (what little there is of it) . . . is 180 degrees a different strategy. I don't understand the end game there."); Ex. Depo. 3 at 92:18-93:1 (Cue).)

- e. In 2013, Mr. Cue forwarded a news article titled "9 Smart and Useful Features of Apple's iPhone Ecosystem That Make it Hard to Switch" to his team. (PX-415.1; Ex. Depo. 3 at 128:7-25 (Cue).)
- f. In 2016, a former Apple employee commented that "the #1 most difficult [reason] to leave the Apple universe app is iMessage . . . iMessage amounts to serious lock-in" to the Apple ecosystem. (PX-416.3; Ex. Depo. 3 at 114:14-115:2 (Cue).) Greg Joswiak, an Apple executive, responded to other Apple executives that "we hear this a lot". (PX-416.1.) In turn, Mr. Schiller wrote "note Joz and I think moving iMessage to Android will hurt us more than help us, this email illustrates why" and Mr. Schiller shared this analysis with Mr. Cook, who forwarded the email to other high-level Apple executives. (PX-416.1.)
- g. Similarly, in late 2016, Mr. Schiller forwarded an article to "the highest level executives at Apple" (Schiller Trial Tr. 2981:11-2982:19) titled "iMessage is the glue that keeps me stuck to the

iPhone”. (PX-2356.1.) The article stated, “[T]he main draw of iOS is really interoperability between iPhone and other Apple products, and nothing is stickier in that regard than iMessage (for better or worse).” (PX-2356.4.)

h. iMessage remains unavailable to non-iOS devices. (Schiller Trial Tr. 3172:2-12 (SMS and iMessage are different protocols, and “if [the two devices sending messages] are different, it sends an SMS. And if they are both iPhone or Apple-related devices, then it will send an iMessage and that gives added features.”).)

61. Apple has continued to identify new ways to keep users in its iOS ecosystem. In December 2019, Mr. Cook asked, “What could we do that would give us a long term competitive advantage for both enterprise and consumer?” (PX-842.2.) Mr. Federighi responded, “Our primary strategy here is to *eliminate user-entered passwords.*” (PX-842.1 (emphasis in original).) These passwords would not transfer if a user switched from an iOS device to an Android device. (Schiller Trial Tr. 2990:2-9.) Mr. Federighi explained that “use of these features is likely to make our platform more ‘sticky’”. (PX-842.2.)

62. Apple provides users of its devices with a suite of features that are available only for Apple devices, including AirDrop, used to send files and information to nearby devices without an Internet connection (DX-5492.163; DX-5335.5); Instant Hotspot, used to “connect[] other Apple devices to a personal iOS or iPadOS hotspot” (DX-5492.149); “Find My”, which allows users to locate missing devices, is also designed to work only for Apple

devices (*see* DX-5492.145-146); and family sharing of iCloud storage (Schiller Trial Tr. 2962:25-2963:10).

63. “Continuity” is another Apple feature that Apple executives have been informed draws users deeper into the iOS ecosystem. (*See* PX-2356.4.) According to Apple expert Professor Hitt, Continuity is “a suite of tools that allow [users] to seamlessly transition between files and processes on separate Apple devices”, and Handoff, one feature within the suite, “allows users to begin a process or task on one device and continue doing so on another device”. (DX-5335.5.) Professor Hitt further notes that this feature serves to “create[] an infrastructure to integrate different devices in [Apple’s] ecosystem”, as “[u]sers are able to switch between [Apple] devices without losing information or progress.” (DX-5335.5.)

64. Altogether, these Apple device-specific features encourage users to buy multiple Apple devices, which Apple executives have been informed make it difficult to leave the Apple ecosystem. (*See* PX-416.1; PX-2356.4 (“[T]he main draw of iOS is really interoperability between iPhone and other Apple products.”).)

65. Apple’s prior adjudicated antitrust violations have not deterred it from seeking to lock more and more consumers into its ecosystem, even when its conduct results in higher consumer prices.

a. Following a bench trial, the United States District Court for the Southern District of New York found that Apple knowingly violated the antitrust laws in a price-fixing case involving eBooks. (*See* Schiller Trial Tr. 2983:13-2984:7.)

- b. A monitor was appointed to ensure that Apple could not continue its anti-competitive conduct. (Schiller Trial Tr. 2984:12-14.)
- c. Mr. Cue was Apple's primary trial witness at the trial. (Schiller Trial Tr. 2985:13-15.)
- d. The court's findings did not convince Apple to refrain from pursuing anti-competitive conduct.

B. Switching Costs Tend To Lock Users into iOS.

66. The various types of costs for users to change platforms—for instance, from iOS to Android—are called “switching costs”. (Evans Trial Tr. 1494:23-24 (“[S]witching costs refer to the obstacles of moving from one product to another product.”).) “Sunk costs” refer to consumers’ up-front investments—including the price of the device and learning how to use it—these are switching costs that a user would have to incur again if they were to switch. (Evans Trial Tr. 1494:19-1495:21.)

- a. Switching costs include the amount of time and effort that it takes for a user to switch from one platform to another, such as between an iOS and Android device—for instance, how much time it takes to ensure that all app-related data that was downloaded onto the user’s old device are transferred to the new one; which apps on the new OS replicate the functionality of those apps the user downloaded on the old OS; and accounts the user created can be transferred (Athey Trial Tr. 1756:8-9 (“[N]ot every app [available]

on iOS might be available on an Android.”); Ex. Expert 4 (Athey)

¶¶ 20-23; Evans Trial Tr. 1496:5-13 (“If you switched . . . from

iPhone to Android . . . there are, for iOS users, potentially

important apps that you can’t use anymore, and you lose the data

from them and so forth. An example of that is iMessage.

Transferring data in apps. So, for example, if I have my photos

stored in iCloud, then those aren’t going to transfer over.”); see

also Schiller Trial Tr. 2963:3-10 (“Q. And so if I’m in a family

with Apple iPhone users, but I choose to have an Android, and

let’s say we have four people in the family, and we share an iCloud

storage account – which can be done; correct? A. Yes. Q. I, as an

Android user, cannot share that iCloud storage account; correct?

A. That’s true.”); PX-79.)

b. Switching costs include the human confusion and frustrations

involved in switching between operating systems, including

learning how to use the new operating system. (Ex. Expert 4

(Athey) ¶ 20; Evans Trial Tr. 1495:6-13 (Switching costs include

“spend[ing] time learning how to use the operating system and the

other things that go with it, and while this is an example of time,

there are also brains. There is the learning process for an operating

system”), *id.* at 1496:14-16 (While “[t]here is the whole issue of –

it is not impossible, but there's the whole issue of learning a new set of user interfaces and controls for the phone."); *see also* PX-79.)

- c. Switching costs include the financial costs associated with the switch—for instance, losing valuable media, paid apps and in-app purchases that cannot be transferred from one device to another and must be downloaded again; and the cost of peripherals, such as charging cables and docks, that only work with one type of device and not another. (Athey Trial Tr. 1757:21-1758:7 (“So with [the app] Moleskine, I have a library of notes and drawings and sketches that I made while taking notes in class, and so given that I won’t have Moleskine [after switching to Android], I can’t transfer that data.”); Ex. Expert 4 (Athey) ¶¶ 21, 23; *see also* PX-79.)

Consumers incur sunk costs when they have to move from one “operating system ecosystem” to another. (Evans Trial Tr. 1495:3-13.) These costs include “buy[ing] a phone”, which is “expensive”. (Evans Trial Tr. 1495:5-6; *see also* Evans Trial Tr. 1496:20-1497:3. (“[O]ne of the other aspects of an operating system ecosystem is there are generally other things that are complimentary to it under accessories and peripheral devices and so forth. So in the case of the iPhone, a person may have an Apple

Watch or they may have Air Pods. In the case of the Apple Watch, that does not really transfer over at all or very well onto Androids. Air Pods, my understanding is not very well either.”.)

- d. Switching costs include the loss of utility or increased complexity of certain communication with family and friends—for instance, the loss of parental control capabilities, or family sharing on iOS devices. (Athey Trial Tr. 1762:12-1764:20; Ex. Expert 4 (Athey) ¶ 31 (“Apple’s Family Sharing and Screen Time features, for example, only work if both the parent and the child use iOS or other Apple OSs. If the family mixes-and-matches Android and Apple devices, the value of such apps is reduced, and the Android user must either repurchase the family’s apps or not have access to them.”); *see also* PX-79.)

- e. Switching costs include the loss of services associated with a particular operating system (*e.g.*, access to cloud storage) (See PX-79.3, .11-12.)

67. The switching costs of moving from using an iPhone to another mobile device, such as an Android smartphone are substantial. (Athey Trial Tr. 1755:6-1761:7; Evans Trial Tr. 1497:22-1498:5; Ex. Expert 1 (Evans) ¶¶ 83-88; *see also* PX-79; PX-416; PX-2093.)

68. Among the steps that a user considering switching needs to take are the following:

- a. Determining whether apps she uses to manage important devices and critical relationships exist on the new device with equivalent or sufficient functionality (*e.g.*, apps that operate their “smart” home devices such as thermostats and locks) (Ex. Expert 4 (Athey) ¶ 21; *see also* PX-79);
- b. Determining whether other existing apps are available on the new platform (Athey Trial Tr. 1755:12-19; Ex. Expert 4 (Athey) ¶ 21; *see also* PX-79);
- c. Identifying and reinstalling her apps—which, for the average user, would number over 100 (Athey Trial Tr. 1755:12-19; 1756:5-1757:5; 1757:17-20; Ex. Expert 4 (Athey) ¶ 22; *see also* PX-79);
- d. Transferring her app-related data onto a new platform and reestablishing any configured settings (*e.g.*, account settings), which may require her user to reestablish her relationship with each app developer on the new platform (Athey Trial Tr. 1757:23-1758:7; Ex. Expert 4 (Athey) ¶ 23; *see also* PX-79);
- e. For apps that involve subscriptions, users may need to continue to manage their subscriptions on the old platform if they change devices mid-subscription, or they may need to repurchase a

subscription entirely. (Athey Trial Tr. 1758:8-1760:6 (“[I]f I purchased [a New York Times] subscription on my iPhone, I need to continue to manage that subscription through Apple, even though I no longer have an Apple device to manage that subscription.”); Ex. Expert 4 (Athey) ¶ 24.)

69. Users also incur “mixing-and-matching costs” when they access apps and services on devices that have an operating system that is different from their mobile device. (Athey Trial Tr. 1760:23-1761:3; Ex. Expert 4 (Athey) ¶¶ 26-27; *see also* PX-79; PX-407; PX-416.)

70. Mixing-and-matching costs can be “within-user” (*e.g.*, a user wanting to access a note-taking app on both her phone and desktop computer), as well as within members of a group or family (for example, a parent wanting to set various types of monitoring and restrictions on his or her children’s devices). (Athey Trial Tr. 1761:5-1763:24, 1764:1-20; Ex. Expert 4 (Athey) ¶¶ 29-32; *see also* PX-79; PX-407; PX-416.)

71. Due to these switching and mixing-and-matching costs, many users choose devices that work on the same operating system as other devices they use, or that their family and friends use. (*See* Ex. Expert 1 (Evans) ¶¶ 83-88.)

72. Once a user has chosen an operating system, she has made investments in the hardware, software and learning for such operating systems. (Evans Trial Tr. 1494:19-1495:21; Ex. Expert 1 (Evans) ¶ 83; *see* PX-404.1.)

- a. Users who use iOS devices overwhelmingly stick with iOS devices and do not also use (or switch to) Android devices. (Ex. Expert 1 (Evans) ¶ 88; Schmalensee Trial Tr. 1924:8-12; Lafontaine Trial Tr. 2063:17-2064:16; Simon Trial Tr. 391:25-392:5; Patel Trial Tr. 451:6-17.)
- b. For example, data from the Match Group, which develops online dating products (Ex. Depo. 1 at 12:9-25 (Ong)), shows that users of the Tinder dating app generally do not use both iOS and Android devices. (Ex. Depo. 1 at 66:12-24 (Ong).) As Adrian Ong, Match Group's Senior Vice President of Operations testified (Ex. Depo. 1 at 9:10-12, 9:15-18, 9:22-25 (Ong)), users pick a platform, become comfortable with its nuances and stick to it. (Ex. Depo. 1 at 70:6-15 (Ong).)
- c. Similarly, data from Nvidia, which operates a game streaming service called GeForce Now, shows that "below two percent" of users of GeForce Now "used both an Android device and an iPhone device" to access its service. (Patel Trial Tr. 451:6-17.)
- d. And data from Down Dog, which operates a health and fitness app, shows that users do not switch between taking the fitness classes offered on its app on an iOS device and on an Android device. (Simon Trial Tr. 391:25-392:2.) In fact, only two and a half

percent of users take class on an iOS device and then later take a class on an Android device. (Simon Trial Tr. 392:3-5.)

- e. In fact, Mr. Cue testified that he was unaware of anyone switching from an iPhone to an Android phone because an app was available for an Android device but was not available for the iPhone. (Ex. Depo. 3 at 163:11-15 (Cue).)

73. Professor Hitt acknowledged that, even based on his own numbers, just “three to four percent of the installed [iOS user] base” switch from iOS to Android each year. (Hitt Trial Tr. 2163:3-15.) And Dr. Lafontaine, for her part, admitted that she did not “see a universe in which a quarter of iOS users switch to Android every year”. (Lafontaine Trial Tr. 2064:7-16.) Professor Schmalensee similarly testified that “the switching probabilities are relatively low under current conditions”. (Schmalensee Trial Tr. 1924:8-12.)²

74. Apple executives have acknowledged the costs users face in switching between Apple and non-Apple platforms: “The more people use our stores the more likely they are to buy additional Apple products and upgrade to the latest versions. Who’s going to buy a Samsung phone if they have apps, movies, etc already purchased? They now need to spend hundreds more to get to where they are today.” (PX-404.1; Ex. Depo. 3 at 67:13-19, 68:1-13

² Apple has argued that as many as 26% of iOS users that buy a new phone switch to Android, but that number ignores the installed base that keeps its phone for a number of years and, even setting that aside, [REDACTED]
[REDACTED]

(Cue); PX-79.1 (Goldman Sachs report explaining “high switching costs”); PX-80.1 (email to Apple executives attaching the Goldman Sachs report).)

- a. As Mr. Cue put it, acknowledged, switching away from an iPhone could mean spending “hundreds of additional dollars in order to have the same content [the consumer] already had on their iPhone”. (Ex. Depo. 3 at 70:15-20, 22-25 (Cue).)
- b. As noted, in 2013, Apple executives discussed whether to make iMessage available on Android devices. Mr. Federighi said, “I am concerned the [*sic*] iMessage on Android would simply serve to remove and [*sic*] obstacle to iPhone families giving their kids Android phones.” (PX-2093.1.)
- c. In addition, as noted, in March 2016, Mr. Schiller forwarded an email chain to Mr. Cook and recounted the difficulties a former senior Apple employee had when he tried for two months to use an Android smartphone in place of the iPhone he had been using. The former executive explained, “iMessage amounts to serious lock-in.” (PX-416.3.) Mr. Joswiak noted that “we hear this a lot” and Mr. Schiller noted that “Joz and I think moving iMessage to Android will hurt us more than help us, this email illustrates why”. (PX-416.1.)

75. Apple executives have long recognized the costs of switching as an advantage for the Apple ecosystem.

- a. For instance, in June 2013, Mr. Schiller, Apple's then-head of marketing and now Apple Fellow, circulated a Goldman Sachs analyst report to other high-level executives at Apple entitled "Switching from iPhone to Android: how hard can it be?" (PX-79.1.) In a cover email, Mr. Schiller wrote: "Here is an interesting report on the cost and methodology to switch from iPhone to Android (iTunes and iCloud figure pretty big in the ability and the effort involved to switch)". (PX-79; *compare* Schiller Trial Tr. 2851:5-18, *with* Schiller Trial Tr. 2955:13-1956:14.) While no witness asked about the document could recall a conversation about it (although Mr. Schiller came up with something to say about it after his deposition (Schiller Trial Tr. 2953:19-2954:1)), the cover email did not indicate any disagreement with the document's contents. (PX-80.1) The document set forth switching costs between Apple and Android devices and referred to "the raw time and 'pain in the neck' factor"

of switching. (PX-79.3; PX-80.1; Ex. Depo. 3 at 120:20-121:1 (Cue).)

- b. The report concluded that “the cost of switching platforms [from iPhone to Android] is significant, and indeed, it was not possible to transfer all of [the] content” from the iPhone. (PX-79.1.)
- c. Both Mr. Cue and Mr. Schiller have acknowledged that movies purchased on an iOS device cannot be transferred to an Android device. (Ex. Depo. 3 at 126:20-25 (Cue); Schiller Trial Tr. 2959:6-14, 2962:9-16.)

76. Ultimately, switching costs are relevant to the question of market power because switching costs influence the degree to which users could avoid a price increase by leaving the platform. High switching costs enhance market power because when it is costly to leave the platform, users are more susceptible to price increases and user switching is not a significant competitive constraint. (Evans Trial Tr. 1497:7-1498:5.) According to Professor Schmalensee, it is “[b]y definition” true that “if the reason consumers single-home is that it’s very difficult for them to switch, then the situation resembles the situation with a monopoly provider”. (Schmalensee Trial Tr. 1923:6-10.)

C. Because Users Are Locked into iOS, Mobile App Developers Cannot Forget Developing Apps for iOS.

77. Consumer lock-in to the iOS ecosystem also results in higher costs to developers. (Grant Trial Tr. 670:17-671:1; Athey Trial Tr. 1765:18-1766:25.)

78. In order to be successful, app developers typically try to reach as many consumers as possible, which generally requires that they develop apps for as many platforms as possible. As a result, they are unlikely to abandon or substitute away from smartphones, as that would cause them to entirely lose access to users who do not access apps on other platforms. (Evans Trial Tr. 1498:25-1499:8 (“To the extent that the users don’t switch much, that means that the developers pretty much have to keep doing what they are currently doing. So if there was an increase in price and few or no users actually switch from iPhones to Android phones, from iOS to Android operating systems, then developers have to do what they have always done, which is they have to make sure that they have their iOS app available for the very large group of iOS users.”); Simon Trial Tr. 394:2-7.)

a. For example, Mr. Simon of Down Dog testified that “there is very little cross over Android and with iOS for any particular user. In our case specifically, we’ve grown almost entirely by word of mouth. We have done almost no marketing, which means users tell their friends and family about Down Dog. If half of their friends and family can’t download Down Dog because they have an iOS device and not an Android, then that actually amounts to basically halving our growth rate, which is something that compounds over time. So it substantially reduces the ability for us to grow.” (Simon Trial Tr. 393:23-394:7; *see also* Simon Trial Tr.

391:19-21 (noting that typically users who take a class on the iOS app do not switch to taking a class on the web).)

79. As a result of needing to maximize their outreach to consumers, developers incur “multi-homing costs”, or costs of writing apps for multiple platforms. (Ex. Expert 4 (Athey) ¶ 42; Athey Trial Tr. 1768:5-16; Grant Trial Tr. 670:17-22 (“Q. Are there any time or monetary costs involved in [an app being written for another platform]? A. Yes. Depending on the complexity of [the] app, it can be quite significant. It wouldn’t be unusual for an application to have multiple developers who purely work on a specific version for a specific platform.”).)

- a. Developers incur not only the initial cost of writing apps for multiple platforms, but also the costs associated with maintaining, servicing and improving the app on multiple platforms over time. (Grant Trial Tr. 670:22-671:1 (“It’s both an upfront cost to get the application to work on the additional platforms and then it’s an ongoing consideration. Every feature that you add that relies on APIs will have to be recreated or modified to work on other platforms.”); Athey Trial Tr. 1768:13-16 (“To provide their services across two platforms, the developers . . . have to port the code. Different code runs on iOS and Android, and it’s costly to create that additional code base.”); Ex. Expert 4 (Athey) ¶ 42.)

80. Smartphones in particular are critical platforms for developers, given that they are the only devices that virtually everyone has access to at all times. (Sweeney Trial Tr. 111:23-112:1 (explaining why Epic launched *Fortnite* on iOS, noting that “[s]martphones, both iOS and Android, reached a far larger audience than consoles, and so we really wanted to enable *Fortnite* players to be able to play with all of their friends”); 131:1-5 (“A smartphone is a . . . portable supercomputer and it has the ability of a cell phone that has a high-resolution screen, touch input, and internet connectivity that is connected to a cellular network.”).)

81. Today, most mobile app developers write apps for both the Android and iOS platforms. (Ex. Depo. 1 at 32:14-17 (Ong); Ex. Depo. 7 at 306:12-23; 307:21-308:2; 308:4-6 (Okamoto) (86% of developers also program apps for Android in order to “get to the broadest customer set possible”); Simon Trial Tr. 389:24-390:7; Grant Trial Tr. 669:22-670:10.) As Professor Lafontaine, one of Apple’s economic experts, acknowledged, “most smartphone users have either an iOS or an [Android device]”. (Lafontaine Trial Tr. 1919:1-3.)

82. Some mobile app developers choose to develop an Android version of their mobile app before developing the same app for iOS—a concept known in the industry as “Android first”. (PX-42.2; Ex. Depo. 7 at 309:15-310:3; 311:23-312:9 (Okamoto).)

a. Apple has learned that developers do so because there is “[l]ess risk to innovate on Android”, where developers “are willing to test the waters and experiment with new app ideas”. (PX-42.2.) After they “build a buzz for their app on Android”, they “monetize on iOS.” (PX-42.2.)

b. But after proving and refining their concept on Android, these developers then turn to developing the app for the more difficult iOS platform, where they can successfully monetize it. (PX-42.2; Ex. Depo. 7 at 311:23-312:9, 312:16-18, 312:20-25, 320:4-10, 320:14-22 (Okamoto).)

83. When a developer has both Android and iOS versions of the same app, the relatively more affluent iOS users spend much more in the app than do their Android counterparts, making iOS the “monetization platform of choice” for developers. (PX-42.2) Because they would lose access to these consumers on their mobile devices without an iOS app, developers virtually never forego app development for iOS. (Ex. Depo. 7 at 320:4-10, 14-22 (Okamoto); Ex. Depo. 2 at 79:24-80:10 (Shoemaker); Simon Trial Tr. 393:21-394:12.)

a. Apple’s own presentations confirm that iOS is the monetization platform of choice for developers, as a 2016 Apple presentation stated: “OUR CUSTOMERS SPENT NEARLY 2X more than [Google Play’s], and THAT’S what developers care about the most.” (DX-4526.32.)

84. And although in theory an iOS developer unhappy with Apple could simply leave the iOS platform and write only for Android, most mobile app developers do not consider abandoning iOS to be a viable option. (Ex. Depo. 2 at 79:24-80:10 (Shoemaker); see Sweeney Trial Tr. 112:2-17) (describing the importance of the iOS userbase).)

- a. Distributing apps on iOS is a virtual necessity for developers.
(Sweeney Trial Tr. 112:3 (“iOS is a vital platform for [our] business.”); *see also* Athey Trial Tr. 1872:24-25 (“[D]evelopers make more [money on] iOS [than Android].”).) Developers cannot afford to forgo distributing their apps to iOS users, as doing so would entail giving up access to approximately one billion potential customers, who form the most lucrative part of the available customer base. (Federighi Trial Tr. 3362:2-3; Ex. Depo. 7 at 320:4-10, 320:14-22 (Okamoto); Sweeney Trial Tr. 112:4-15 (“[R]eaching the entire base of Apple[‘s] 1 billion iPhone consumers is a paramount goal for our company.”).)
- b. For example, mobile app developer Match Group could not just abandon iOS and develop solely for other platforms, because iOS has the “majority of the distribution”. Leaving iOS would be “extremely destructive” for Match Group. (Ex. Depo. 1 at 69:20-21, 69:23-70:5 (Ong).) Accordingly, Match Group does not view distribution on Android as a substitute for distribution on iOS. (Ex. Depo. 1 at 67:23-68:1 (Ong).)
- c. Mobile app developer Down Dog also does not consider leaving iOS to be a choice because of the need to reach iOS users. (Simon Trial Tr. 393:23-24 (“Again, there is very little cross over between

Android and with iOS for any particular user.”).) Down Dog would still develop for iOS even if the App Store raised its commission fee by 20% or doubled its annual developer fee because of the necessity of reaching the iOS userbase. (Simon Trial Tr. 393:2-14; 393:16-20.)

85. Ultimately, the high cost to consumers of leaving the iOS ecosystem gives Apple enormous bargaining power over developers. (Ex. Expert 4 (Athey) ¶¶ 35-38.) Because so few consumers switch, each developer needs to offer its apps on iOS to reach a vast portion of the available consumers for smartphone apps. (Ex. Expert 4 (Athey) ¶¶ 35-38.) This dynamic makes developers heavily dependent on Apple (Ex. Expert 4 (Athey) ¶¶ 36-38), especially given Apple’s unilateral discretion to decide which apps will be available on iOS.

D. The Origin of the App Store.

86. When the first iPhone was launched in 2007, the only “native” apps available on the device were those written by Apple. (Ex. Depo. 3 at 47:15-19 (Cue); Schiller Trial Tr. 2727:17-19.)

87. However, at that time, different executives at Apple had different views on whether Apple should enable “native” third-party app development for the iPhone. One group, including Apple’s then-CEO Steve Jobs, felt that Apple should never allow third parties to create native apps for the iPhone, and that third parties could use web applications instead. Another group believed in a “hybrid model” where third-party app developers would rely on a combination of web technologies and native abilities to create iOS apps. A third group,

including Scott Forstall, former Senior Vice President of Apple (iOS Software), advocated for enabling third-party native app development on iOS, in part because the “voluminous” technological benefits of native apps over web apps would provide a better experience for iPhone users. (Ex. Depo. 4 at 77:16-20, 77:24-78:12, 78:16-79:6, 81:2-84:6 (Forstall); PX-870.1 (Mr. Forstall writes: “I do think at some point we will want to enable third parties to write apps . . . I still think that touch device-specific apps will provide a better experience.”).)

88. After the launch of the iPhone, Apple quickly realized that there was significant third-party developer interest in writing native apps for iOS, and that new third-party apps would help Apple sell iPhones. (Ex. Depo. 4 at 85:1-9 (Forstall); Schiller Trial Tr. 2980:23-25 (“Q. And it was apps that were key to selling iPhones, correct? A. Certainly very important features of [the] iPhone.”).)

- a. Several third-party app developers approached Mr. Forstall and asked whether they could build native apps for the iPhone. (Ex. Depo. 4 at 85:1-9 (Forstall).)
- b. In addition, app developers started “jailbreaking” iPhones—that is, a modification of iOS which allows the download and execution of apps not distributed via the official App Store (Schiller Trial Tr. 2729:19-24; PX-871.1)—so that they could write native applications, which Mr. Forstall interpreted as an indication of demand for such capabilities. (Ex. Depo. 4 at 85:19-24, 86:1-5 (Forstall).)

89. At an August 2007 meeting, Mr. Forstall and Mr. Jobs, along with other top Apple executives, discussed “[o]pen[ing] up” the iPhone’s software to third-party app developers like Electronic Arts. (PX-872.1.)

90. By October 2007, Mr. Jobs had changed his mind about enabling third-party native app development on the iPhone and told Mr. Forstall that he wanted such functionality enabled by early 2008. (PX-874.1; PX-876.1.)

91. In the months that followed, Apple executives and software engineers debated the proper distribution method for third-party applications and specifically whether “Apple signed applications” would be posted exclusively to an “online store”, or whether third parties would be permitted to “distribute on their own”. (PX-877.3; Ex. Depo. 4 at 125:12-15; 127:3-8, 129:8-24, 130:5-131:12 (Forstall).) Apple’s security experts remained out of this debate, noting that the question of exclusive distribution is one of “policy”, as opposed to security. (PX-877.3 (“Signing does not imply a specific distribution method, and it’s left as a policy decision as to whether Apple signed applications are posted to the online store, or we allow developers to distribute on their own.”); Ex. Depo. 4 at 130:5-131:12 (Forstall).)

92. On March 6, 2008, Apple held an event before a group of developers and enterprise consumers to announce the opening of iOS to third-party apps, the release of developer tools for app development and the launch of the App Store. (PX-880.8, .20; Ex. Depo. 4 at 161:20-162:16 (Forstall).)

a. At the event, Mr. Jobs announced that “the App Store is going to be the exclusive way to distribute iPhone applications directly to

every iPhone user”. (PX-880.21; Ex. Depo. 4 at 161:20-162:16 (Forstall); Schiller Trial Tr. 2738:2-11.) He then described the App Store’s “business deal” for developers: “When we sell the app through the App Store, the developer gets 70% of the revenues right off the top. We keep 30[%] **to pay for running the App Store.** . . . So when a developer wants to distribute their app for free, **there is no charge for free apps at all.** . . . The developer and us have the same exact interest which is to get as many apps out in front of as many iPhone users as possible.” (PX-880.21 (emphasis added); Ex. Depo. 4 at 163:14-164:25 (Forstall).)

- b. During the event’s Q&A session, Mr. Jobs was asked: “[Doesn’t] the fact that Apple is going to be the exclusive distributor for all these applications raise some questions about monopolies and so forth? What if a developer doesn’t want to distribute through the App Store?” Mr. Jobs responded: “Then they won’t be able to distribute their app on the iPhone but we don’t think that’s going to be the case with almost every developer. Remember, the developer wants to get their app out in front of every iPhone user and there is no way for even large developers to do that, much less small developers. So we think this is going to a boon for

developers and they are going to love it”. (PX-880.27; Ex. Depo. 4 at 171:5-16 (Forstall).)

- c. After confirming that “there wouldn’t be a way for [developers] to distribute [apps] without iTunes or [the] App Store”, Mr. Jobs continued: “And also, just to make it a little clearer, **we don’t intend to make money off the App Store. . . . [W]e are basically giving all the money to the developers here** and if that 30% of it pays for running the store, well that will be great, but we just want to create a very efficient channel for these developers to reach every single iPhone user.” (PX-880.27 (emphasis added); Ex. Depo. 4 at 173:5-174:10 (Forstall).)

93. The App Store was devised as a storefront that could incentivize developers to create innovative and useful apps for the iOS platform in order to attract users. (PX-870; Ex. Depo. 4 at 79:10-17, 80:6-20 (Forstall); 85:1-9; Schiller Trial Tr. 2733:23-2734:4; PX-880.20.)

94. The App Store was intended to be a way to promote the iPhone and sell more devices. (PX-880.21 (“The developer and us have the same exact interest which is to get as many apps out in front of as many iPhone users as possible.”); PX-2060.18 (Mr. Jobs: “Our purpose in the App Store is to add value to the iPhone. Free apps do that just as well as paid apps sometimes. We love free apps.”); *id.* at .19 (Mr. Jobs: “We don’t expect [the App Store] to

be a big profit generator. We expect it to add value to the iPhone. We'll sell more iPhones because of it.”.).)

a. Apple recognized that an important way to attract users to iOS was by providing a variety of apps, including a robust set of apps developed by third-party developers. (PX-314.5 (“An ecosystem including third party apps made our products more attractive.”); DX-4566.1 (Mr. Jobs: “We are excited about creating a vibrant third party developer community around the iPhone); Ex. Depo. 3 at 45:11-14 (Cue).)

95. App development requires tools. (Grant Trial Tr. 684:18-22 (“Q. Now you've mentioned a number of different things involved in a developer writing an app. Is there any relationship between those things and the word ‘tool’? A. Yes. Generally you would refer to things like debugger, a complier, profiler as tools that were specific to a platform.”).)

96. Apple had already developed a set of tools—prior to the launch of the App Store—for native iOS app development for the first iPhone in 2007. (Ex. Depo. 8 at 49:1-8 (Cue); PX-880.8 (“Starting today we are opening up the same native APIs and tools that we use internally to build all our iPhone applications. This means that third party developers can build native iPhone applications *using the same SDK that we do.*”) (emphasis added).) These tools were based in part on the Integrated Development Environment (which was marketed by Apple as Xcode) available for macOS, which Apple had released since 2003. (Ex. Depo. 4 at 37:23-38:1, 38:6-8 (Forstall); Grant Trial Tr. 675:8-10 (“Q. Is there a relationship between Xcode and

macOS? A. Yes. It would be the same. It would be the primary application to develop and app for macOS.”.)

97. At the iPhone’s launch, third parties had neither the software tools nor the access necessary to write native apps for iOS and have them distributed on the iPhone. (Ex. Depo. 3 at 47:15-19 (Cue).) In connection with the App Store launch, Apple announced the release of the iOS “software development kit”, or “SDK”, as well as information regarding a series of “application programming interfaces” (“APIs”). (PX-880.8; Ex. Depo. 4 at 161:20-162:16 (Forstall).)

- a. Developers can use the iOS SDK to create iOS apps. (Grant Trial Tr. 685:9-11.)
- b. SDKs generally include information concerning APIs that developers use to create apps for a particular operating system. APIs are sets of definitions and protocols for building and integrating application software, and allow third-party developers to program their apps to connect to operating system-provided functionality. (Grant Trial Tr. 669:10-13 (“SDK stand[s] for ‘software development kit’. It would be the items necessary to create an app for a platform. It will have a selection of tools. It will have documentation. It will . . . contain the means of accessing APIs.”).)

- c. APIs made available to third-party developers are referred to as “public APIs”. (Grant Trial Tr. 675:16-20 (“A public API is an API that the creator of an operating system or platform exposes and wishes a developer to call. It will be documented, listed. It is something that they intend somebody to use.”).)
- d. A platform developer also often has “private APIs”, which are APIs not made publicly available. (Grant Trial Tr. 676:23-677:4 (“Q. What does a private API mean? A. It is an API that is part of a platform or operating system, but the provider of that platform does not wish developers to use it, so they will not document it.”); Kosmynka Trial Tr. 1101:9-12 (“The intention of the API is not to have it used in third-party developer apps at this point.”), 1101:13-14 (“Q. And to whom is it private? A. To Apple.”).)

98. Generally, every OS is different and its tools for development are created for its particular characteristics. An app written with Android SDKs does not run on the iOS platform and vice versa. (Ex. Depo. 3 at 61:25-62:1, 62:3-62:5, 63:5-63:6, 63:8-9 (Cue); Grant Trial Tr. 669:22-670:10 (“Q. Do you know whether or not an app that is developed for iOS will run on the Android platform? A. It will not, no. Q. Do you know whether or not an app that is developed for Android would run on the iOS platform? A. No, it will not.”); Simon Trial Tr. 390:5-7; Fischer Trial Tr. 873:3-8.)

99. Apps can be written for all OS platforms if a developer has access to these platforms and has the skill, time and money to invest in writing apps for that OS. (Grant Trial Tr. 670:11-671:20.) Most often, the company controlling the operating system makes the tools needed to write apps for that operating system available for free or at a nominal price, so as to attract third-party developers. (Grant Trial Tr. 686:15-18 (“Q. Are you aware of any platform that charges more than a nominal cost for the use of an API or SDK? A. I can’t think of any platforms that even have a nominal cost.”); PX-868.22 (Apple presentation surveying SDKs on different platforms and noting that “[a]ll programs provide free SDKs and documentation”); Ex. Expert 1 (Evans) ¶ 10; Evans Trial Tr. 1540:13-16 (“So what Mr. Jobs is announcing here is consistent with the user pays model where the idea is to make it as easy as possible for developers to create apps, not charge them, and then make money from the user side.”).) Free or nominally priced tools incentivize app development. (Evans Trial Tr. 1540:17-21 (“[T]he whole idea is I can get a lot of developers to write apps, and that is going to make the platform more interesting to users and . . . sell [more] devices, iPhones.”).)

100. Apple distributes its developer tools for free, but charges an annual fee for membership in its Developer Program.

- a. For example, Apple makes the SDK developers need to program apps for the macOS used by Mac personal computers available for free. (PX-2622.5; Schiller Trial Tr. 2758:3-8, 2758:17-24.)
- b. Apple also makes the tools necessary for iOS development available to developers for free through its Xcode Software

Development Environment. Any interested developer with an Apple ID can download Xcode and begin programming iOS apps. (Schiller Trial Tr. 2757:9-16, 2758:3-8, 2758:19-24; *see also* PX-2622.4)

- c. However, if developers wish to distribute their iOS apps to users, then they must join the Apple Developer Program. (PX-2619.2; Schiller Trial. Tr. 2759:25-2760:9.) This requires developers to sign the Developer Program License Agreement and pay an annual \$99 fee to Apple. (Simon Trial Tr. 353:12-15 (“I believe we had to sign up as a developer, pay the \$99 developer fee and sign various agreements.”); Schiller Trial. Tr. 2759:25-2760:9, 2761:21-25.)³)
- d. Apple also charges developers for technical assistance in programming their iOS apps. Though the annual \$99 fee covers a consult with Apple’s Technical Services team on “two specific technical areas [for which developers] would like assistance, guidance or otherwise”, technical assistance beyond the two

³ Developers may also distribute through the Developer Enterprise Program, for which they would pay Apple a \$299 annual fee to distribute apps within their organization. (*See* Section II.F below.)

covered incidents costs an additional \$99 “per incident”. (Ex. Depo. 5 at 29:18-30:3, 32:6-7 (Haun).)

E. Apple Recognizes that Having More Developers on Its Platform Enables It to Sell More iPhones.

101. As Mr. Federighi, Apple’s Apple Senior Vice President of Software Engineering, explained, apps are vital to the iOS ecosystem: “[A]pps are the center of the iOS experience.” (Federighi Trial Tr. 3431:17-19; *see also* Federighi Trial Tr. 3445:4-6 (agreeing that “apps add value to the iPhone”).)

102. As more developers write apps for an OS platform, more users are attracted to that OS platform. (PX-2060.18-19; Fischer Trial Tr. 855:9-856:8; Ex. Depo. 4 at 40:24-41:4, 41:6-9, 41:11-13, 41:15-18 (Forstall); Ex. Expert 1 (Evans) ¶ 22; Evans Trial Tr. 1540:17-21 (“[T]he whole idea is I can get a lot of developers to write apps, and that is going to make the platform more interesting to users and . . . sell [more] devices, iPhones.”).) As more users adopt an OS platform, so too do more developers, resulting in a positive feedback loop. (Ex. Expert 1 (Evans) ¶ 19.) This positive feedback loop is the result of indirect network effects. Indirect network effects occur when participants on one side of the platform value having more participants on the other side with whom they can have a mutually beneficial interaction. (Ex. Expert 1 (Evans) ¶ 19.)

103. Apple recognizes that “offer[ing] [well-known developers] on the iOS platform” “would attract users to the iOS platform”, and thus “sell more iOS devices”. (Ex. Depo. 7 at 324:4-13, 324:20-325:1, 325:3-6, 325:8-10 (Okamoto).) According to Mr. Jobs, “Our

purpose in the App Store is to add value to the iPhone. Free apps do that just as well as paid apps sometimes. We love free apps.” (PX-2060.18.)

104. Apple’s promotion of its hardware focuses on using developers’ creativity and innovation to showcase capabilities of these devices. As Apple’s Senior Director of Partnership Management and Worldwide Developer Relations testified, part of the appeal of Apple devices is that the “catalog of apps” is “impressive”. (Ex. Depo. 18 at 330:3-6, 330:17-21, 330:22-331:1 (Pruden).)

105. In connection with promoting the iPad Pro in 2018, for example, Apple highlighted the availability of “over 1 million apps specifically designed to transform your iPad into anything you need with just a tap”. (Ex. Depo. 18 at 330:17-21 (Pruden).)

106. Similarly, when the iPhone 12 was launched in 2020, Apple held an event “to announce [the phone] to the world” (Ex. Depo. 18 at 286:10-11; 286:13-15 (Pruden)) and invited about “a dozen” developers—including “a hiking app”, “the NFL”, “Red Bull TV”, and “League of Legends [Wild Rift].” (Ex. Depo. 18 at 284:18-21; 285:6-9, 285:13-17 (Pruden)).

107. Apple wants developers of “popular games”, such as Epic, on iOS so that the platform is more “attractive for [its] users”. (PX-854.2 (listing a set of developers and games that Apple noted it would “like to target”); Ex. Depo. 7 at 324:4-13, 325:3-6, 325:8-10 (Okamoto).).

108. With regard to Epic, Apple recognized that Epic brought value to the platform by being “a very well-known developer that had some very strong titles on it” and that

Epic's apps could showcase "what a great gaming device the iPhone with iOS was." (Ex. Depo. 7 at 324:4-13 (Okamoto).)

109. Apple even considered seeking Epic's agreement to create exclusive games for iOS. (Ex. Depo. 16 at 324:4-13 (Okamoto); *see also* PX-442.2 (Ms. Pruden: "We've asked them what it would take to make Fortnite exclusive to iOS on mobile (for a limited time) and they had one clear answer: 2-hour App Review.").)

110. Apple has repeatedly sought other exclusive content from Epic for iOS as well.

- a. Apple has requested *Fortnite* items to promote its App Store gift cards. (DX-3144.2-3 (noting that "the benefit" of Epic "offer[ing] a free Fortnite item bundle in game with purchase of an App Store gift card" would be "mostly Apple's").)
- b. Apple has also requested other "iOS exclusive" game features, such as skins (*i.e.*, in-game costumes and other cosmetics). (Weissinger Trial Tr. 1338:4-16 ("Q. So, generally speaking, overall, how would you say Apple was as a partner from a marketing perspective? A. I always felt like it was opportunistic. I felt like it was transactional, impersonal. It always felt like in some sense it was kind of fly-by-night where they could come in for a particular promotion, they would show up, and they would ask for assets and then there would be strings attached or caveats

attached of *well, we want to promote this thing but we require an exclusive asset or we require exclusive content*, and those requests would come in kind of late in the process, and it would cause undue burden and stress on the team. These were requests that typically we don't receive from our console partners.”).)

- c. In 2018, Apple asked Epic to participate in its Worldwide Developer Conference (“WWDC”) to showcase “some of your positive experiences regarding the Fortnite development effort and the role [Apple Tool] Metal” played in that. (DX-3068.1)

111. Additionally, an Apple executive has acknowledged that Epic has introduced “sever[al] breakthrough technologies” in the Unreal Engine. (PX-43.2; Ex. Depo. 16 at 325:19-20, 326:1-5, 327:11-14 (Okamoto).)

112. Indeed, Epic has introduced several innovative technologies to iOS, including through the *Unreal Engine*. (Grant Trial Tr. 681:18-682:8 (“Q. Does Epic create any cross-platform specific features for the *Unreal Engine*? A. Yes, we do. Q. Can you describe them please? A. Yes. It could be simple features such as ability to draw graphics, to play audio for platforms that have more advance[d] capabilities such as AR. We will have cross-platform ways of doing AR on multiple platforms should they support that. Q. And does Epic create any cross-platform features for iOS? A. Yes. Q. And can you describe that? A. Yes. It would be the ones I listed. The ability to play audio, the ability to do AR, to open files, to read files, to write files, to draw graphics.”).)

F. iOS App Store Profitability.

113. Even before Apple charges anything for distribution of apps through the App Store, Apple already has earned significant amounts that compensate it for its investments in its iOS products and ecosystem.

- a. Through sales of the iPhone and iPad (PX-606; PX-1055.1; PX-2391.6);
- b. Through sales of wearables and other accessories (PX-2391.6);
- c. Through fees paid to join the Apple Developer Program;
 - i. Apple charges developers \$99 annually to join and remain in the Apple Developer Program (Ex. Depo. 5 at 28:21-29:1 (Haun)).
- d. Through fees paid to join the Apple Developer Enterprise Program;
 - i. In addition to the Developer Program, Apple maintains a Developer Enterprise Program, which charges a \$299 annual fee and allows businesses, organizations and institutions to create and distribute “internal-use apps to their employees” on iOS. (PX-2519.1.)

114. As discussed above, when Apple launched the App Store in March 2008, Mr. Jobs assured developers that the store’s 30% commission charged to developers for paid apps was designed only to cover its costs. He also stated that “when a developer wants to

distribute their app for free, there is no charge for free apps at all". (PX-880.21; Ex. Depo. 4 at 164:4-11 (Forstall).) Additionally, Mr. Jobs explained, "It costs money to run it. Those free apps cost money to store and to deliver wirelessly. The paid apps cost money, too. They have to pay for some of the free apps. We don't expect this to be a big profit generator. We expect it to add value to the iPhone. We'll sell more iPhones because of it." (PX-2060.19.)

- a. Mr. Jobs's representations demonstrate that Apple was going to operate the iOS operating system "consistent with the user pay model where the idea is to make it was easy as possible for developers to create apps, not charge them, and then make money from the user side." (Evans Trial Tr. 1540:6-16.)

115. Initially, App Store revenues were based on a commission structure in which app developers paid a percentage of their revenues (30%) for sales of apps. (PX-99.2; Ex. Depo. 2 at 63:22-24, 64:01-64:13 (Shoemaker).)

116. During the time between the launch of the App Store in 2008 and the introduction of IAP in 2009, in-app payment processing and app distribution were entirely separate and iOS developers were monetizing their apps with in-app payment solutions that were self-provided. (Ex. Depo. 4 at 230:5-11, 230:16-18, 230:20-22, 230:24-231:2, 252:6-252:13 (Forstall).)

- a. For example, a February 2009 email from Shaan Pruden to Ron Okamoto noted "Skyscape: Need to remove in-app commerce capabilities, working to have them change their model for

providing medical reference”. (PX-1813.3.) Another email from February 2009 similarly corroborates the fact that Skyscape allowed users to “purchase all your content directly from Skyscape from within the app”. (PX-1701.2.)

- b. Another February 2009 email between Cindy Lawrence and Shaan Pruden about the “launch of [a] store-less” Kindle app “following [Apple’s] guidance from a week ago”. The purpose of the “revised Kindle App” was that Amazon “removed the in-app commerce” function. (PX-1815.1.)
- c. In early March, C.K. Haun emailed Greg Joswiak and Ron Okamoto that the “Kindle reader app for iPhone/iPod touch is ready for release. Since they originally submitted they've changed their app to mesh with our Ts&Cs. They've removed their in-app commerce, and instead now go to Safari and the standard web site for purchasing anything from Amazon.” (PX-1818.1.) Similarly, another email from March 2009 corroborates the fact that Amazon Kindle offered “free sample chapters of books with a buy now button enabling the transaction in the app with one click purchasing”. (PX-1703.1.)
- d. On March 31, Ms. Lawrence wrote that the Unbound Medicine app “continues to violate the Ts and Cs, specifically with in App

Commerce.” (PX-1709.1.) Later in April, Tyler Stone reported to C.K. Haun that this issue had been “corrected”: “The Unbound Medicine app used to have an order form within the app which was actually a WebKit view loading an optimized website” but “[t]hey have, as instructed by us, changed that so now their app instead launches Safari and the customer proceeds on the Unbound Medicine website”. (PX-1709.1.)

- e. Mr. Forstall similarly agreed that “there were some apps on the App Store prior to the release of IAP that were using their own payment mechanisms for different kinds of purchases made in the app”. (Ex. Depo. 4 at 252:06-13 (Forstall); Trial Tr. 3096:17-21.)
- f. Mr. Schiller’s testimony that there were no in-app commerce opportunities that developers availed themselves of prior to Apple’s introduction of IAP (Schiller Trial Tr. 3195:6-11; *see also* Apple Findings of Fact (May 19, 2021 submission) ¶ 53) is directly refuted by the record evidence.

117. Apple did not invent in-app purchasing. In December 2008, Apple executives reviewed an internal Apple presentation entitled “In-App Commerce”. (PX-888.2.) The presentation described “Current App Commerce Models”, including “In-App”. (PX-888.3.) The presentation has several slides describing examples of apps and platforms that had in-app purchasing technology (PX-888.16-23)—all before Apple required apps selling digital content to

use IAP on iOS. The presentation also describes “What Developers are Asking For”, complete with examples of developers that wanted to sell in-app digital content on iOS. (PX-888.26.)

118. Apple executives viewed this competition as a “leak” in the App Store model: C.K. Haun emailed Ron Okamoto in January 2008 noting that many games “have a healthy after-market in additional game levels, enhanced graphics for in-game activities, and other data up to and including completely new games that can be created from an installed base game engine”, and that developers were likely to want to employ this model of monetization for their iPhone apps. (PX-897.2.) In response to Haun’s warning that “the new level/enhanced graphics business for fee (outside of [the iTunes Music Store]) [is] possible easily”, Apple executive Greg Joswiak replied: “If this is accurate, it sounds like we’ll have to make sure our terms don’t allow this.” (PX-897.1-2.)

119. And so Apple began requiring developers to use IAP for when they sold digital goods in their apps, at a 30% commission. (DX-4192.4.) As Apple’s CEO noted, this was a choice that Apple made—“there are clearly other ways to monetize”, and Apple “chose this one because [it thought] this one overall [was] the best” for it. (Cook Trial Tr. 3990:6-11.)

120. As Apple executives internally acknowledged, the App Store became profitable in 2009 and has been profitable ever since. (*See* PX-406.1 (July 2009 email where Mr. Cue states, “(w)e are definitely making money”); Ex. Depo. 3 at 89:13-90:7, 90:9-91:13 (Cue).)

a. Mr. Cue testified that the App Store has “been financially successful (for Apple) since it was first introduced”. (Ex. Depo. 3 at 79:4-6; 79:8-11 (Cue).) In fact, Apple has been able to create

multiple revenue streams from the App Store, including: (1) in-app purchase (IAP); (2) subscription sales; and (3) search advertising (Search Ads). (Ex. Depo. 3 at 84:1-9, 85:10-12, 85:19-22, 87:23-88:06. (Cue).)

- b. From these collective revenue streams, Apple makes [REDACTED] of dollars on the App Store every year. Apple's internal presentations to executives with decision-making authority over the App Store show net revenues of [REDACTED] in fiscal years 2018 and 2019, respectively. (See Sections II.F, IV.C below.)
- c. At its current size, [REDACTED]
[REDACTED] Fischer Trial Tr. 863:14-19.)
- d. Mr. Forstall testified the App Store "has obviously done, far, far better than" covering costs. (Ex. Depo. 10 at 175:11-25 (Forstall).

121. The App Store's operating margin is uniquely and persistently high, far in excess of virtually any other online marketplaces or retail distributors. (See Section IV.C below.)

- a. Internal profitability analyses prepared by Apple's FP&A department indicate that the App Store enjoyed profit margins of [REDACTED] for both fiscal year 2019 and 2020. (PX-2385.18; *see also* Section IV.C below.)

- b. Notably, Apple's profit margin in fiscal year 2016 was [REDACTED] indicating that the App Store enjoyed [REDACTED] increase in profitability in the three years between 2016 and 2019. (PX-2385.18; *see also* Section IV.C below.)
- c. Epic's forensic accounting expert, Ned Barnes, corroborated these figures with his own analyses. (*See* Section IV.C below.)

122. Apple's 30% commission structure was never based on any analysis of Apple's costs to run the store or provide services to app developers. (Ex. Depo. 3 at 137:23-138:14 (Cue); Schiller Trial Tr. 3105:12-3106:5.)

123. At no time since the 30% commission structure was chosen have costs of the App Store or services provided to app developers been a consideration in its structure. (Ex. Depo. 3 at 140:10-15, 140:17-21, 140:24-141:3, 141:13-20, 141:22-142:9 (Cue); Schiller Trial Tr. 3105:12-3106:5.)

- a. In fact, when Apple changed the commission rate for renewal subscriptions from 30% to 15% for the second year, one reason it did so was because "it was simple to just cut it in half". (Schiller Trial Tr. 3106:10-14.)

124. Developers have indicated their view that a 30% commission is too high (Fischer Trial Tr. 910:25-911:11) and some do not believe that Apple's 30% fee, compared to fees for other payment processors, is "justifie[d]". (*See* Simon Trial Tr. 377:3-10.)

125. Some developers have said they “would not launch a native iOS app because of the 30 percent commission structure”. (Ex. Depo. 3 at 150:5-12 (Cue).)

- a. Many businesses, including small businesses, cannot afford to absorb Apple’s commission rates—whether 30% or 15%—and cannot afford to pass the costs on to consumers without losing users. (Ex. Expert 1 (Evans) ¶ 275.)
- b. Apple executives were informed that Kazaa, for example, was a music-streaming service that did not “plan[] to create a native iOS app due to the 30% IAP subscription rev[enue] share” (PX-418.1.)

126. Apple often claims that it has never raised its prices to developers. (Schiller Trial. Tr. 2740:14-15.) This is incorrect for at least the following reasons.

127. As noted above, when Apple introduced IAP in 2009, it began requiring developers to use IAP when they sold digital goods in their apps, at a 30% commission. (Schiller Trial Tr. 2790:2-14, 2790:19-21; DX-4192.4.) When Amazon launched its Kindle app on iOS in 2009, Apple approved an exception for Amazon to not use IAP for digital purchases. (PX-1714.1 (“For e-Books we allow them to do what Amazon’s Kindle app does: they kick you out to their website to purchase the actual book.”).)

128. In 2011, Apple imposed a new requirement that developers who sold in-app subscriptions would always have to use IAP and pay a 30% commission, whereas before 2011, developers could instead send users outside of the app to purchase subscriptions at no cost. (DX-3060.2 (“[P]ublishers may no longer provide links in their apps (to a web site, for example)

which allow the customer to purchase content or subscriptions outside of the app"); PX-1849.1 (email pre-dating 2011 subscriptions announcement stating, “[a]ll in-app purchases and in-app subscriptions share revenue at the same 70/30 split with Apple as app purchases – Links out of the app to purchase with other mechanisms are no longer necessary or allowed”); PX-108.1 (“Current Apps – Must migrate from current business model to IAP”), (“New Apps – No longer allowing business models outside App Store.”); Ex. Depo. 3 at 85:19-85:22 (Cue); Ex. Depo. 16 at 366:11-12, 366:15-17, 366:25-367:2 (Okamoto); *see also* PX-98.7 (Apple added IAP in 2009, and “it has aided their bottom line significantly”); Ex. Depo. 2 at 63:22-24; 64:01-64:13 (Shoemaker).)

129. Then in 2016, Apple launched “Search Ads” in the App Store. With Search Ads, Apple began asking developers to pay for the privilege of appearing first in Search results when iOS users search for apps within the App Store. (Ex. Depo. 3 at 87:23-88:6 (Cue); Ex. Depo. 8 at 94:9-13 (Cue); Schiller Trial Tr. 2817:8-21.)

- a. One of the ways that consumers find iOS apps they want to use among the millions of apps in the App Store is by searching app names or keywords in the Search bar in the App Store (similar to how users search for webpages using a search engine like Google). (Ex. Depo. 3 at 87:23-88:6 (Cue).)
- b. Through Search Ads, Apple auctions the first placement in App Store Search results to app developers. (Schiller Trial Tr. 2816:1-6; Ex. Depo. 11 at 132:25-133:13 (Friedman); Ex. Depo. 8 at

93:19-21, 93:23-94:7 (Cue); Schmid Trial Tr. 3316:12-22.) For example, a user who searches the name of one app may not see that specific app as the first result in the list returned by Search, but instead may see a competing app whose developer has won the bid in the auction conducted by Apple. (Schiller Trial Tr. 2817:8-21; Ex. Depo. 8 at 93:23-94:7 (Cue); Ex. Depo. 11 at 133:2-133:13 (Friedman); *see also* Fischer Trial Tr. 865:5-8, 866:7-13, 867:8-18, 868:24-869:6; Schmid Trial Tr. 3318:11-13 (“Q. Would it surprise you if Pandora came up first in a search for Spotify on the App Store? A. I would not be surprised.”).)

- c. Some Apple executives conceived and proposed Search Ads as a way of profiting from certain app developers’ willingness to pay “bot nets” to illicitly inflate their organic placement in Search, a form of “chart gaming” that Apple had been unable to prevent: “[I]f people are willing to pay ‘marketing companies’ (bot nets) to gain position, why don’t we just let them pay us to gain position?” (PX-254.1; Ex. Depo. 6 at 134:25-135:1, 136:2-18, 138:18-24 (Friedman).)
- d. In 2018, Tim Sweeney complained to Matt Fischer that “it’s super-frustrating that Fortnite is not the first search result when customers search for the text: ‘Fortnite’. Some days, Microsoft

buys the search results, other days it's another competitor."

(PX-2031.2.)

- e. Revenue from search ads in the App Store now exceeds [REDACTED] [REDACTED] per week and a billion dollars a year. (Ex. Depo. 3 at 89:1-5, 109:4-18, 109:21-110:17, 117:13-19, 117:24-118:1 (Cue); Ex. Depo. 8 at 94:19-22 (Cue); PX-411.15-16 (forecasting revenue of over \$1B for fiscal year 2021); PX-413.1 ("Search Ads generated \$ [REDACTED] in revenue" for period from November 6-12, 2020); PX-414.1 (reporting "Search Ads generated \$ [REDACTED] for period from August 23-29, 2019); PX-2366.1 ("Search Ads generated \$ [REDACTED] in revenue" for period from September 11-17, 2020); Schiller Trial Tr. 3091:21-3093:9.)

- f. Notably, Mr. Cue conceded that the expected internal rate of return for Search Ads for the App Store was [REDACTED]. (PX-411.15; Ex. Depo. 3 at 110:3-17 (Cue).)

130. It is true that Apple has never changed its "*headline* commission" for IAP of 30% (Schmalensee Trial Tr. 1973:22-1974:2 (emphasis added)), but that masks the economic realities that developers face.

- a. As Professor Schmalensee testified, "the range of transactions to which that commission applies . . . has changed" over time. (Schmalensee Trial Tr. 1974:3-1974:6.) Professor Schmalensee

admitted that “when Apple introduced IAP, it effectively imposed a price increase” on in-app purchases, assuming (as is true) that developers previously were not required to pay anything to Apple for the sale of in-app digital content. (Schmalensee Trial Tr. 1974:20-1975:9.)

- b. Likewise, Professor Schmalensee conceded that when Apple began requiring developers who offered subscriptions to use IAP, Apple imposed a “price increase” on subscriptions, assuming (as is true) that Apple previously had not charged developers who offered subscriptions on iOS. (Schmalensee Trial Tr. 1975:10-1977:5.) In his words: “If you could [offer subscriptions] and you didn’t pay a commission . . . and then Apple said, ‘[i]f you do it, you pay a commission,’ by definition, that’s a price increase.” (Schmalensee Trial Tr. 1976:25-1977:4.)

131. Moreover, the fact that Apple has never changed its headline commission is not evidence that Apple has chosen not to charge a profit-maximizing price. As Professor Schmalensee testified, “determining the profit-maximizing price requires taking into account all of the facts and circumstances that face the business”. (Schmalensee Trial Tr. 1977:20-25.) “[O]ne of the facts and circumstances that a business would rationally take into account in setting a profit-maximizing price would be the possibility of regulatory action”. (Schmalensee Trial Tr. 1978:4-9.) Another is “the possibility of legislative action”. (Schmalensee Trial Tr.

1978:10-13.) “Apple has been under antitrust scrutiny here in the United States and around the world on App Store-related issues” since at least 2016, and raising its headline commission would deprive Apple of the talking point it has provided to this Court and the United States Congress that it has never raised its headline commission rate. (Schmalensee Trial Tr. 1979:3-1980:8.)

132. The data also demonstrates the costs that developers have faced.

- a. It is undisputed that the average commission rates for in-app purchases have remained steady at around 30%. (Kosmynka Trial Tr. 1021:10-13; Hitt Trial Tr. 2109:8-10, 2110:24-2111:3; Ex. Expert 6 (Hitt) ¶ 217, Figure 52; Ex. Expert 13 (Cragg) ¶ 107, Figure 25; Ex. Expert 16 (Evans) ¶ 48.)
- b. It is likewise undisputed that the per-transaction dollar amount paid by developers has precipitously *increased* over time (Hitt Trial Tr. 2110:24-2111:3; Ex. Expert 13 (Cragg) ¶ 100 (“Apple’s per-transaction commission has increased [REDACTED] between 2009 and 2019. . . .”)), even though the service provided by Apple has not changed or improved. (See, e.g., Hitt Trial Tr. 2166:8-19; Cragg Trial Tr. 2284:10-2286:3.)

133. Apple used an erroneous methodology to calculate an average commission rate of 8.1%, claiming this shows a declining rate. To arrive at this figure, Professor Hitt assigned a commission rate of 0% to all free game downloads on the App Store (*see* Ex. Expert 6

(Hitt) ¶¶ 180, 269). This methodology is erroneous because 0% of \$0 is undefined (Ex. Expert 13 (Cragg) ¶ 98) and as a result creates results that decouple any mathematical relationship between the total revenue collected on a set of transactions, Apple's commission, and the purported average commission rate.⁴ In any event, using Apple's methodology and applying it *over time*, Apple's average commission measure has significantly *increased* from about 3% to 8.1%. (Cragg Trial Tr. 2283:15-2284:21; Ex. Expert 13 (Cragg) ¶ 103, Figure 24.)

134. The total App Store "billings"—*i.e.*, the amount that customers spent on digital goods and services in apps from the App Store—was approximately \$ [REDACTED] in 2020. (Ex. Depo. 9 at 298:20-25 (Fischer).)

⁴ Professor Hitt, for example, conceded that his methodology would yield the same commission rate for a set of transactions yielding revenues of \$20 and a commission of \$3 and a set of transactions reflecting the same commission but half the revenues. (Hitt Trial Tr. 2198:24-2200:6.)

III. THERE IS AN AFTERMARKET FOR iOS APP DISTRIBUTION.

135. As set forth in the following paragraphs, there is a relevant antitrust aftermarket for app distribution on iOS (the “iOS App Distribution Market”). Sections III.A-E discuss the existence and definition of a relevant foremarket for smartphone operating systems; Section III.F discusses Apple’s market power in the foremarket; and Sections III.G-M discuss the existence and definition of the aftermarket.

A. There Is a Foremarket for Smartphone Operating Systems.

136. There is a relevant two-sided foremarket for smartphone operating systems. (Ex. Expert 1 (Evans) ¶ 62; Evans Trial Tr. 1484:17-25, 1486:19-21; *see also* DX-3084.12 (Apple bar graph labeled: “Operating system purchasing”).)

137. All computing devices, including smartphones, are powered by an operating system. (Sweeney Trial Tr. 132:4-11; Grant Trial Tr. 663:10-17.)

138. Before a consumer can even consider purchasing an app, she must purchase a device on which to install and run apps. As discussed below, there are currently only two smartphone operating systems with significant market share, each at the core of a separate, differentiated ecosystem of devices, accessories, apps and services: Apple’s iOS and Google’s Android OS. (*See* Sections III.E-F below.) When a consumer wishes to purchase a smartphone, the first choice she must make therefore is which operating system she wants the device to run and which mobile ecosystem she wants to participate in.

139. A “foremarket” is a market where there is competition for a long-lasting product and from which demand for a second product is derived. (Ex. Expert 1 (Evans) ¶ 40;

Evans Trial Tr. 1485:3-13.) In this case, the consumer's choice of a smartphone operating system determines her demand for apps; apps that are created for iOS cannot be used on Android devices and apps created for Android cannot be used on iOS devices. (*See* Section III.K below.)

140. There is a foremarket for mobile operating systems, and it is separate from the aftermarket for app distribution. (Ex. Expert 1 (Evans) ¶¶ 41-42.)

- a. The starting point for market definition is the conduct at issue. (Ex. Expert 1 (Evans) ¶ 33; Ex. Expert 16 (Evans) ¶ 3; Evans Trial Tr. 1453:5-11, 1503:19-1504:1, 2387:10-2389:23; Schmalensee Trial Tr. 1941:1-5; Lafontaine Trial Tr. 2031:1-9.)
- b. An operating system is the “app development platform” that “enables developers to create apps” and gives consumers the ability to use them. (Evans Trial Tr. 1479:13-21.)
- c. App distribution is the “distribution mechanism” between developers that make apps and the consumers who want them. (Evans Trial. Tr. 1479:3-12.)
- d. App distribution and operating systems are not the same. (Evans Trial Tr. 1479:13-15.) App distribution occurs at a later time than the consumer obtaining a phone or a developer creating an app. (Evans Trial Tr. 1479:22-23.)
- e. The market for smartphone operating systems is a foremarket because the operating system is the locus of relevant developer and

consumer demand, and the operating systems facilitate the distribution of OS-specific apps by developers to consumers. (Ex. Expert 1 (Evans) ¶ 44.)

- f. In the foremarket, the consumer makes the decision to purchase a smartphone with a specific operating system installed. Similarly, on the other side of the platform, the developer makes the decision to develop an app for a particular operating system. (Evans Trial Tr. 1485:14-1486:6.)
- g. The market for iOS app distribution is an aftermarket because it “derives” from the operating system market. The existence of the foremarket provides an installed base of smartphone users with a particular operating system for whom developers can create apps. Without an operating system used by consumers, developers could not distribute apps, and consumers could not download and use apps. (Ex. Expert 1 (Evans) ¶¶ 40-42; Evans Trial Tr. 1486:7-18; Ex. Expert 4 (Athey) ¶¶ 42-44.)

141. To define the foremarket, Dr. David Evans, Epic’s expert in antitrust economics, first assessed a variety of qualitative factors described further below. Smartphones have unique features and their operating systems are general purpose operating systems. Other electronic devices such as gaming consoles and PCs and their operating systems are poor substitutes for the times and places in which consumers want to use mobile apps. (*See*

Section III.C.) Because these other operating systems are not substitutes for consumers, they are also not substitutes for developers; the only way to meet the demand by customers who use a particular operating system is to have an app that runs on the operating system that those customers use. (*See* Section III.D.) Therefore, operating systems for other devices are not significant competitive constraints on smartphone operating systems.

142. Dr. Evans also performed a standard test to determine product market boundaries (Evans Trial Tr. 1491:2-8): whether a hypothetical monopolist of smartphone OSs could profitably impose a small but significant and nontransitory price increase (“SSNIP”) above a competitive level, or whether such a SSNIP would instead result in sufficient switching to an alternative product to make the price increase unprofitable. (Ex. Expert 1 (Evans) ¶ 35.) This test for market definition, known as the “hypothetical monopolist test”, or SSNIP test, is prescribed by the Antitrust Division of the Department of Justice and the Federal Trade Commission. The agencies typically assume a SSNIP to be in the 5%-10% range. (Ex. Expert 13 (Cragg) ¶ 18; *see also* Cragg Trial Tr. 2250:14-19 (“The standard test is the hypothetical monopolist test.”).) .”).) No Apple expert has performed a hypothetical monopolist test. (Schmalensee Trial Tr. 1929:3-22; Hitt Trial Tr. 2185:18-2186:3; Lafontaine Trial Tr. 2050:12-22; Hanssens Trial Tr. 3550:22-24.)

143. To perform this analysis, Dr. Evans assumed that the average smartphone operating system costs \$30, which is the high end of the reported price range for license fees that Microsoft charged for the Windows Phone OS. (Ex. Expert 1 (Evans) ¶ 67.) Dr. Evans applied a 10% SSNIP, or an increase of \$3, and added it to the average price of a smartphone. (Ex.

Expert 1 (Evans) ¶ 68.) Dr. Evans demonstrated that it is implausible that a material number of consumers would switch to other devices in the face of a \$3 price increase. (Ex. Expert 1 (Evans) ¶ 68.) As a conservative check on his analysis, Dr. Evans also considered whether the results of a SSNIP would hold for higher priced operating systems and price increases, and he confirmed that they would. (Ex. Expert 1 (Evans) ¶ 68.) He showed it to be implausible that such an increase would lead to sufficient switching to make the price increase unprofitable. (Ex. Expert 1 (Evans) ¶ 68.)

144. Although Apple takes the position that the relevant foremarket product (if any) is mobile devices, rather than operating systems, this position is driven by litigation and does not reflect Apple's sincere view of the market dynamics. For example, Mr. Cook refused to admit on the stand that Apple "compete[s] against Google in operating systems". (Cook Trial Tr. 3891:5-12.) But roughly two years ago, Mr. Cook publicly acknowledged that Apple "compete[s] on the operating system side with . . . Google and Microsoft", as distinct from Apple's "compet[ition] in the hardware space with Samsung and Huawei and many other prominent Chinese companies". (PX-1721.7; Cook Trial Tr. 3891:13-3892:3.)

145. In reality, when consumers purchase a smartphone, they choose it based on the operating system: iOS or Android. (Evans Trial Tr. 1485:14-1486:1.) In this regard, the market for smartphone operating systems is analogous to the market for computer operating systems. As Professor Schmalensee testified, there is "an ordinary market" for computer operating systems that includes competitors such as Microsoft's Windows, which is

commercially available to original equipment manufacturers to license, and Apple’s macOS, which is not. (Schmalensee Trial Tr. 1960:17-1961:12.)

146. Similarly, the market for smartphone operating systems includes Google’s Android, which is commercially available, and Apple’s iOS, which is not. The fact that Android is not sold at a positive price does not prevent economists from defining the market or shield Apple or Google from antitrust scrutiny; as Professor Schmalensee testified, “[t]here is a price that’s being paid” by original equipment manufacturers who take on “a number of obligations” when they license Android from Google. (Schmalensee Trial Tr. 1962:14-1963:13; Ex. Expert 16 (Evans) ¶ 6; Evans Trial Tr. 2377:7-2379:11.)

147. Finally, courts have previously recognized that operating systems can constitute a relevant product market. In *United States v. Microsoft Corp.*, 253 F.3d 34 (D.C. Cir. 2001), for example, the court defined the market as Intel-compatible operating systems. (Evans Trial Tr. 2378:4-16; *see also* Schmalensee Trial Tr. 1959:16-1960:9 (discussion of Professor Schmalensee’s prior writings where he “acknowledged . . . that there can be a market for operating systems themselves” and “talked about operating systems competing”).)

B. The Geographic Market for Smartphone OSs Is Global Excluding China.

148. Smartphones are sold globally. (Ex. Expert 1 (Evans) ¶ 70.) Smartphone operating systems are also sold around the world and generally work regardless of location. (Ex. Expert 1 (Evans) ¶ 70.)

149. The market for smartphone OSs excludes China (Evans Trial Tr. 1491:9-12), where government policies limit domestic competition. (Ex. Expert 1 (Evans) ¶ 71.)

- a. Due to government regulations, Android original equipment manufacturers distribute different versions of their devices, with different sets of pre-installed apps, inside and outside of China. Different versions of the Android operating system are pre-installed by original equipment manufacturers inside China. Smartphones with the version of Android used in China are generally not sold outside of China, and smartphones that have the Google version of Android are generally not sold in China. (Ex. Expert 1 (Evans) ¶ 71.)
- b. Government regulations, as well as other factors unique to China, also have resulted in the broader digital economy in China being dominated by domestic firms. (Ex. Expert 1 (Evans) ¶ 108.) China thus has a separate smartphone app ecosystem. Many of the most popular non-Chinese apps are not available in China, and the most popular Chinese apps have generally not been successful outside of China. (Ex. Expert 1 (Evans) ¶ 71.)

150. Dr. Lafontaine acknowledged that, when reaching her geographic market limited to United States consumers, she did not consider developers' ability to directly distribute apps to consumers. Indeed, she did not know whether direct distribution is limited by national boundaries. (Lafontaine Trial Tr. 2067:7-2068:3.)

C. Consumers Do Not View Other Electronic Devices as Substitutes for Smartphones.

151. There are a number of different types of devices that use apps to make certain functionality available to consumers. (Sweeney Trial Tr. 133:3-11; Grant Trial Tr. 664:2-6 (“Q. What types of devices, if any, use apps? A. Smartphones, computers, game consoles. . . . Those would be the most common examples today.”) These devices come in a variety of shapes and sizes, and have a variety of qualities and characteristics. For many uses, they are not reasonable substitutes. (Ex. Expert 13 (Cragg) ¶¶ 31-33, 73-79; Cragg Trial Tr. 2269:21-2271:21.)

152. The devices that have been discussed in this matter include:

- a. Smartphones;
- b. Tablets;
- c. Personal Computers (“PCs”) (both Windows and Macs); and
- d. Gaming consoles such as the Microsoft Xbox, Nintendo Switch, and Sony PlayStation.

153. Smartphones are multi-purpose computing devices. Consumers use smartphones because these devices provide features that consumers want, including being small and portable, having access to the Internet anytime, anywhere, and providing GPS location services. (Sweeney Trial Tr. 131:1-5 (“A smartphone is a . . . portable supercomputer and it has the ability of a cell phone that has a high-resolution screen, touch input and internet connectivity that is connected to a cellular network.”); Grant Trial Tr. 687:6-11 (“A smartphone would be a mobile phone that likely has a touchscreen. It will have internet access available. It will have a

web browser that you can put a common website address or search engine to access the internet that way. It will have an App Store that you can download and install additional apps to extend the functionality of your phone.”); Expert 1 (Evans) ¶ 48; Evans Trial Tr. 1460:17-1461:12 (the smartphone is “mobile” and “fits in your pocket, it’s easy to carry around all the time” and “is connected to the internet pretty much all the time”), 1487:8-23 (“[T]he key [smartphone features] to keep in mind [are] that it is mobile, and it has a cellular connection that provides that anywhere, anytime productivity. And then, furthermore, [it] has various features included on the phone that are useful to consumers and ultimately developers when people are out and about doing things.”); Ex. Expert 13 (Cragg) ¶¶ 73-77; Schiller Trial Tr. 2723:8-16 (smartphones are “highly personal devices with a growing amount of information everywhere you go, roaming on other networks everywhere you go”); Federighi Trial Tr. 3362:22-3363:6; Cook Trial Tr. 3850:1-6 (“You have a phone in your pocket or your pocketbook most of the time, and you want instant service.”). Consumers value smartphones because when they are “away from home”, it may be the “only” device they have with them. (Ex. Depo. 5 at 170:23-171:10 (Haun).) And even if consumers do sometimes carry another device—such as a laptop—when away from home, smartphones are constantly connected to the Internet, are handheld and use touch controls that make them far more convenient to use when away from home, both for playing games and for other purposes. (Grant Trial Tr. 689:9-13 (“A smartphone would be compact, it would be portable. You would be able to use it around the house freely or outside the house. There [are] no wires associated with either power or internet access.”); Ex. Depo. 5 at 171:25-172:8 (Haun); Ex. Expert 1 (Evans) ¶ 28; Ex. Expert 13 (Cragg) ¶¶ 73-77.)

154. Developers that do not make smartphone apps will likely be unable to reach consumers who are on the go or who do not have other devices. (Evans Trial Tr. 1461:5-1462:3, 1487:8-23, 1489:19-1490:8 (“[P]ersonal computers are not a good substitute for smartphone operating systems from the developer standpoint because they can’t reach the consumer for a good portion of the time when the consumers wants to use an app on a smartphone . . . [a]nd don’t have . . . access to a variety of features on smartphones that consumers want to use.”).)

155. Feature phones are not reasonable substitutes for smartphones.

a. Although they allow users to make phone calls and sometimes provide basic functionality (*e.g.*, send text messages, take pictures), they lack many other qualities of smartphones, including a connection to the Internet and the full suite of functionality that requires Internet access. (Sweeney Trial Tr. 131:9-12 (“A feature phone is something like a cell phone from back in the Nokia days, a device for making phone calls and sending and receiving text messages, but generally lacks the ability to run sophisticated apps.”); Grant Trial Tr. 687:6-12 (noting access to a web browser and the ability download and install apps as the “main differentiating factors” between feature phones and smartphones).)

156. PCs are not reasonable substitutes for smartphones. (Evans Trial Tr. 1488:17-1490:8; Ex. Expert 1 (Evans) ¶¶ 50-51, 53-54.)

- a. PCs are not portable. While individuals can carry laptops around, they are materially bulkier and heavier than smartphones. (Athey Trial Tr. 1761:11-17 (“So if you were in the park in the morning, you might have access to an iPhone. At a different time of day, say in the afternoon, you might be doing productivity-related activities, say on a laptop with a larger screen and a keyboard, where you can input information. And then at night before bed, you might want a medium-size screen to read a book with larger print or to watch a show.”); Ex. Expert 13 (Cragg) ¶¶ 31-33, 73-77; Cragg Trial Tr. 2269:21-2271-71.)
- b. PCs require using a keyboard and often a mouse. Mobile devices do not. (Ex. Depo. 5 at 171:25-172:8 (Haun); Grant Trial Tr. 690:7-11 (“On a mobile phone the user is going to be using touch and touching the screen which is less accurate than a keyboard or mouse. On a PC, we can expect the user to have a keyboard or mouse and perform high precision tasks.”); Ex. Expert 13 (Cragg) ¶¶ 73-77 (“Hardware differences between gaming platforms drive large differences in mobile and non-mobile game design. Mobile users cannot control a game as nimbly or precisely as do users utilizing a mouse or controller on a PC or console connected to a large screen.”).)

- c. To access the Internet for email, search and for other basic applications, PCs typically require access to a wired or WiFi connection. (Grant Trial Tr. 689:11-12 (“There [are] no wires associated with either power or internet access [for smartphones].”), 689:14-15 (“Conversely, a PC would . . . have power for internet, for wires.”).) Unlike PCs, smartphones can access these applications through cellular networks. (Evans Trial Tr. 1461:5-12, 1487:8-23, 1488:25-1489:18; Sweeney Trial Tr. 131:2-5 (“A smartphone . . . [has] internet connectivity that is connected to a cellular network.”); Schiller Trial Tr. 2721:5-6 (describing Apple’s goal of making the iPhone “the internet in your pocket”); Cook Trial Tr. 3850:1-6 (noting that “[y]ou have a phone in your pocket or your pocketbook most of the time, and you want instant service”).)
- d. Unlike with smartphones, consumers cannot perform functions on PCs while they are “on the go”—for example, taking photographs or ordering a car to pick them up at a specific location. (Evans Trial Tr. 1461:5-12; 1488:17-1489:7 (“[P]ersonal computer[s] . . . lack . . . portability [and a] cellular connection.”); Schiller Trial Tr. 2722:15-16 (“[A] phone you rely on for making phone calls and

being connected and available to use all the time.”); Grant Trial Tr. 689:9-13.)

- e. In the U.S., at least 89% of households have personal computers and 88% of internet-using adults had smartphones, which shows they are not substitutes; if they were, consumers would only need one and not the other. (Ex. Expert 1 (Evans) ¶ 51; PX-1070; Ex. Expert 13 (Cragg) ¶ 44 (“[T]he regular concurrent use of multiple electronic devices – which typically come at considerable cost to the user – is strong evidence that these goods are used incrementally, for distinct purposes, rather than as substitutes.”).)

157. Game consoles, including the Sony PlayStation, Microsoft Xbox and Nintendo Switch, are not reasonable substitutes for smartphones. (Sweeney Trial Tr. 138:23-25; Expert 1 (Evans) ¶¶ 50, 53-54); Evans Trial Tr. 1459:5-1461:20 (“The key distinction between a smartphone and game consoles . . . is that the smartphone can be used anywhere, anytime. And that means that a consumer, no matter what time of day, no matter where they are in the country . . . can use the smartphone.”).)

- a. Gaming consoles are “single purpose” devices—they are intended and used almost exclusively for gaming. (Sweeney Trial Tr. 138:18-21 (“A console is a fixed function device as [it is] typically plugged into a television and controlled using a game controller or a joystick. It’s focused specifically on games and entertainment

experiences.”); Wright Trial Tr. 555:24-556:5; Grant Trial Tr. 693:21-694:1 (“[A single purpose device] is a device that has one single purpose. I think I would describe a game console as being a single purpose device for entertainment.”).) For example, a gaming console “is typically a fixed device that is not something people carry around . . . [and] it doesn’t provide the opportunity to use it anywhere, any time as a smartphone could”. (Evans Trial Tr. 1459:20-1460:1.) One cannot use a gaming console while out and about to perform, for example, personal banking. (Sweeney Trial Tr. 312:10-19; Grant Trial Tr. 695:3-4.)

- b. These single-purpose devices do not offer the same general computing features as smartphones, such as the ability to make calls, take photographs, “GPS” or “cellular capability”. (Sweeney Trial Tr. 138:20-21 (“[Consoles are] focused specifically on games and entertainment experiences.”); Wright Trial Tr. 535:20-536:12; Grant Trial Tr. 693:24-694:1 (“I think I would describe a game console as being a single purpose device for entertainment.”), 694:13-19 (“The APIs in a console will be significantly lower than you would find on an operating system. [This] will effectively act to limit the scope of application you might create. You could create a very good game or a video platform, such as Netflix, but you

wouldn't find yourself creating an application to answer email, for example, or to manage a to-do list."); Evans Trial Tr. 1460:17-1461:20, 1472:9-1473:16 (discussing mobile operating systems as general purpose operating systems); DX-5552.2-3 (App Store permits more than 25 categories of apps for iOS devices, ranging from "Navigation" to "Developer Tools" to "Finance"); Schiller Trial Tr. 3131:22-3132:15 (game consoles are not used for "non-gaming-related phone call[s]", "banking apps", or "personal investment information").)

- c. There are significant hardware differences between smartphones and game consoles like the PlayStation 4, the Xbox One and the Nintendo Switch. (Ex. Expert 13 (Cragg) ¶¶ 73-77; Cragg Trial Tr. 2254:2-10, 2256:8-16; Sweeney Trial Tr. 139:17-23 ("The performance of *Fortnite* on Xbox and PlayStation is typically much higher [than on smartphones]. You have a higher graphical fidelity. You have certain graphical features which are available only on high-end consoles and PCs, such as advanced shadows and reflections that make the 3D world of *Fortnite* more realistic."), 140:9-11 ("The big difference with Switch is that it only works when it is connected to a WiFi network, so you can't use it on as many on-the-go scenarios."), 145:18-20 ("Consoles have

considerably more graphics performance; therefore, the capability of displaying more realistic images.”), 145:24-25 (“Consoles generally have more computing performance similar to run more realistic simulations, such as particle systems.”); Grant Trial Tr. 695:4-9 (“The user will be interacting [with a game console] through a controller using thumb sticks and buttons. They will have the same characteristics of a PC where you can reasonably utilize . . . all of the performance with no concern for battery life.”); PX-2274.1 (“The experience of driving games on a phone or tablet isn’t ideal (no wheel or controller, holding a small display, not on a loud speaker system, etc) and the business model is not what most users want for mobile games . . .”).)

d. Lori Wright, Vice President of Xbox Business Development at Microsoft, testified that the Xbox console is not a reasonable substitute for iOS devices. (Wright Trial Tr. 538:13-21.)

i. *First*, unlike iOS devices, the Xbox console requires peripherals (*i.e.*, other equipment) to operate. (Wright Trial Tr. 536:13-537:13; *see* PX-2778.1.) It is not possible for a user to play a game on an Xbox console, for example, without connecting it to a display screen, speakers and a controller. (Wright Trial Tr. 537:10-13.) It must always be

- plugged into a power outlet to operate, and it has no cellular capability—Internet connection is limited to WiFi or ethernet. (Wright Trial Tr. 536:13-537:13.)
- ii. *Second*, Ms. Wright testified that the Xbox is a special purpose platform because it “is designed to give you a gaming experience. People buy an Xbox because they want to play games.” (Wright Trial Tr. 555:24-556:5.) In contrast, iOS devices are general purpose devices because there is a “wide, wide variety” of “different ideas and applications that can come through it”. (Wright Trial Tr. 557:10-15.) As a special purpose device, Microsoft’s Xbox console is designed and marketed “to optimize the game experience”, and it cannot perform many of the functions that iOS devices can, such as requesting a rideshare, taking a photo or obtaining driving directions. (Wright Trial Tr. 535:20-536:12.)
- iii. *Third*, Ms. Wright testified that not only are consoles and iOS devices different in their functionality, but the types of games that are available on both types of devices are dramatically different, with console games requiring more computing power and graphic fidelity than mobile devices

can provide. (Wright Trial Tr. 538:22-539:7.) For example, a Microsoft presentation identifying competitive game releases for 2020 and 2021 identifies a list of high-intensity games that will be released only on consoles or PC—not iOS devices. (PX-2476.) For Xbox console games, “developers have taken a design choice to build an experience that they want to have rendered . . . with all the compute power, graphic fidelity, that this box provides.” (Wright Trial Tr. 539:22-25.) In contrast, mobile games are designed for a “more casual” gaming experience and the “vast majority are free to play and then have in-app purchase mechanisms as part of them.” (Wright Trial Tr. 539:8-16.) Even when console game titles are rewritten to run on iOS devices, “they’re different games. They feel different. They operate different[ly]. They’re just leveraging the marketing brand of that, but it is a different version of the game that is written to run on iOS.” (Wright Trial Tr. 636:11-17.)

- e. Dr. Evans similarly testified on the “fundamental difference[s]” between general purpose and special purpose operating systems. (Evans Trial Tr. 1472:9-1473:16.)

- i. General operating systems typically follow the “user pays” model, where developers receive access to the operating system for free or a nominal charge. (Evans Trial Tr. 1474:5-17.) This in turn “stimulates the supply of apps”, which attracts consumers to the platform. (Evans Trial Tr. 1474:18-24.) In order to earn its revenue, the platforms charge consumers access fees. (Evans Trial Tr. 1474:18-24.)
 - ii. Special purpose operating systems, on the other hand, including game consoles, charge developers to access the platform and attract consumers through hardware sold at cost or below cost. (Evans Trial Tr. 1475:19-1476:8.)
- f. Professor Schmalensee also agreed that iOS, like Windows, macOS and Android, is a “general-purpose operating system” and thus “provide[s] a platform for app developers and users to make all kinds of software”. (Schmalensee Trial Tr. 1969:5-14.) He distinguished general-purpose operating systems from “more special or niche operating systems”, such as video game consoles, which are “designed and marketed primarily for games”. (Schmalensee Trial Tr. 1969:15-1970:11, 1970:16-1971:2.)

g. As a result, gaming consoles do not compete with iOS devices.

For example, while Microsoft recognizes Sony's PlayStation as a "direct competitor" to its Xbox console and the Nintendo Switch as a competitor but "to a much lesser extent" than the PlayStation, Ms. Wright testified that "[w]e certainly don't view iPhone as a competing device" and "[w]e do not view the iPad as a competing device" to the Xbox console. (Wright Trial Tr. 537:14-538:2.) In fact, Microsoft does not market its Xbox console as a replacement or substitute for iOS devices because consumers do not "play[] one at the expense of another". (Wright Trial Tr. 643:18-24; DX-5532.11-12 (Microsoft Corporation Form 10-K statement listing Apple and Google as competition for Windows but not Xbox).)

158. Further evidence that consumers do not view consoles as substitutes for smartphones is demonstrated by the fact that nearly all console owners also own smartphones. If the two were substitutes, consumers would not need to own both. (Evans Trial Tr. 1488:1-3, 1488:9-16; Ex. Expert 1 (Evans) ¶¶ 50-51; Ex. Expert 13 (Cragg) ¶ 44 ("[T]he regular concurrent use of multiple electronic devices—which typically come at considerable cost to the user—is strong evidence that these goods are used incrementally, for distinct purposes, rather than as substitutes.").)

D. Developers Do Not View Other Electronic Devices as Substitutes for Smartphones.

159. App developers are incentivized to make apps for platforms that consumers use. (Ex. Expert 1 (Evans) ¶¶ 58-61; Hitt Trial Tr. 2124:12-16; Cragg Trial Tr. 2255:20-2256:3; Athey Trial Tr. 1768:18-1769:1.) If app developers ignore a platform that can support adequate functionality for an app, the developer loses out on that economic opportunity to reach the consumers who use that platform. (Evans Trial Tr. 1460:11-16 (“[D]eveloper[s] . . . need to be where the customers are. So if the customers are out and about and have a demand for using an app, then they need to be there.”); Ex. Expert 1 (Evans) ¶ 59; Grant Trial Tr. 671:6-20.)

160. In light of the differences between smartphones and other electronic devices, however, app developers do not view them as reasonable substitutes for distributing their apps. (Evans Trial Tr. 1489:19-1490:8, 1506:10-13 (“[T]he distribution of apps for personal computers and the distribution of apps for game consoles were not a meaningful substitute from the standpoint of the consumer or the developer.”); Sweeney Trial Tr. 146:16-17 (“It makes the experience of *Fortnite* very different between console, PC, and smartphone devices.”); Grant Trial Tr. 689:23-690:20, 694:7-695:12.) This is true even if consumers have or use other devices at some point in time or for some purposes. (Ex. Expert 1 (Evans) ¶ 60.)

161. Developers view smartphones as different from other electronic devices because smartphones are ubiquitous among consumers and because the user experience on a smartphone is very different from the user experience on other electronic devices. (Evans Trial

Tr. 1461:5-12, 1487:8-23.) Developers view iOS in particular to be essential. (Sweeney Trial Tr. 112:2-17 (“iOS is a vital platform for a business.”); Weissinger Trial Tr. 1346:3-1347:1.)

162. Match Group, for instance, does not make its dating services available on gaming consoles, because gaming consoles do not have the same audience as dating apps, users do not carry their gaming consoles with them, and gaming consoles do not offer the feature set on which Match’s mobile device apps rely. (Ex. Depo. 1 at 12:24-13:25 (Ong).) In particular, gaming consoles do not offer location-based features, the ability to receive push notifications and send messages while on the go, native swiping, or continuous internet connectivity. (Ex. Depo. 1 at 12:24-13:25, 120:12-13, 120:16-21, 120:24-25, 121:2-4 (Ong).)

163. The vast majority of users of mobile devices for game applications spend the bulk of their time playing on mobile devices. (Cragg Trial Tr. 2264:23-2265:7.) Ms. Wright, for example, testified that “there are roughly three billion gamers in the world. Ninety-six percent of those gamers play games on a mobile device.” (Wright Trial Tr. 550:4-6.) Further, *Fortnite* data show that the vast majority of *Fortnite* users in general, and iOS users in particular, do not multi-home, in the sense that they do not use multiple platforms for the same purpose, *i.e.*, to play *Fortnite*. (Ex. Expert 13 (Cragg) ¶ 46.) Instead, *Fortnite* users are roughly eight times as likely to play and transact on one platform than they are to play and transact on multiple platforms. (Cragg Trial Tr. 2264:23-2265:7; Ex. Expert 13 (Cragg) ¶ 89, Figure 14; PX-1009.)

164. To test for substitutability, Dr. Cragg analyzed differences in development costs for mobile and non-mobile platforms. He found that developers could expect to expend \$120,000 to \$600,000 to develop a game for a mobile device, whereas the top non-mobile games

ranged from \$135 to \$300 million. (Ex. Expert 13 (Cragg) ¶¶ 81-82, Figure 12.) And “[i]f Apple’s Experts were correct that developers could compete in a single mobile-plus-non-mobile game transaction market, it would be economically irrational for developers to publish their games on both mobile and non-mobile platforms”. (Ex. Expert 13 (Cragg) ¶ 82.) This is confirmed by the market evidence, which shows there is almost no overlap between the most popular mobile games and the most popular games on other platforms. (Ex. Expert 13 (Cragg) Figure 10; *see also id.* ¶¶ 38-39.)

165. As described below in Section III.G, Dr. Evans conducted a study based on *Fortnite* user data that showed that *Fortnite* users typically single-home on one platform, that only 16.7% of the gameplay minutes (or 3.1% of gameplay minutes when accounting for natural cross-progression to gaming consoles and PCs) that would have occurred in the iOS *Fortnite* app absent the removal of *Fortnite* on August 13, 2020 shifted to other platforms, and that it would be unprofitable for developers to abandon the iOS platform in response to a SSNIP.

E. Apple and Google Are the Only Significant Participants in the Foremarket for Mobile OSs.

166. iOS is Apple’s operating system for the iPhone. (Fischer Trial Tr. 874:16-17; Sweeney Trial Tr. 155:10-11 (“Apple exercises total control of its availability of all software on iOS . . .”); Grant Trial Tr. 667:17 (“iOS is Apple’s operating system for mobile platforms.”).) Apple does not license iOS to any other party. (Schiller Trial Tr. 3107:12-13; Cook Trial Tr. 3885:17-18.)

167. Google licenses the Android OS to third parties. (Grant Trial Tr. 688:4-20; Ex. Expert 1 (Evans) ¶ 10.) The firms that make smartphones are called “original equipment

manufacturers”, or “OEMs”. (Grant Trial Tr. 688:2.) OEMs that make Android phones license the Android OS and related services from Google. (Grant Trial Tr. 688:17-20.) Android OEMs include Samsung, Nokia, Microsoft, LG, HTC and OnePlus. Google itself makes a mobile device that uses the Android OS. (Grant Trial Tr. 688:4-6.)

168. Together, Apple’s and Google’s dominance in the smartphone operating system market give them a duopoly (a market defined by two primary participants). (Evans Trial Tr. 1492:4-12; Ex. Expert 1 (Evans) ¶ 74.) There is a strong presumption in the economics of industrial organization that where, as here, a market is a duopoly, both participants have substantial market power. (Ex. Expert 1 (Evans) ¶ 82.)

169. Collectively, Apple and Google have generated more than 89% of the revenue in the smartphone operating system market each year since 2012, and more than 99% of the revenue in the market since 2016. (Ex. Expert 1 (Evans) ¶ 74.) As of 2019, Apple’s iOS holds a 40% revenue share, and Google’s Android OS holds a 60% share. (Evans Trial Tr. 1494:11-18; PX-1059.)

170. There have been no successful entrants into the smartphone operating system market since 2008, when Android OS entered the market. (Ex. Expert 1 (Evans) ¶ 74.) Major software developers have tried and failed to enter the smartphone operating system market. For example, Microsoft attempted to enter the market by launching the Windows Phone OS but ultimately exited the market. (Ex. Expert 1 (Evans) ¶¶ 47, 67.)

F. Apple Has Market Power in the Smartphone Operating System Foremarket.

171. Apple has market power in the smartphone operating system foremarket. (Evans Trial Tr. 1491:17-20.) As one of two participants in a duopoly market, Apple is presumed to have significant market power. (See Section III.E.)

172. The iOS and Android ecosystems are highly differentiated. (Ex. Expert 1 (Evans) ¶ 75.) iOS is designed around Apple's suite of apps and services, and Android is similarly designed around Google's. (Ex. Expert 1 (Evans) ¶¶ 75-76.) They are also differentiated based on the available hardware and the user interface and controls. (Ex. Expert 1 (Evans) ¶ 77.) That iOS and Android devices and their respective operating systems are differentiated limits the degree of substitution between them and therefore enhances the market power of Apple and Google. (Ex. Expert 1 (Evans) ¶ 78.)

173. Apple's market power is further demonstrated by its market share. As noted, iOS has a substantial share of the smartphone operating system market, with iOS and Android together accounting for nearly all of the smartphone sales globally since 2013. (Evans Trial Tr. 1493:12-22; PX-1059.) Over the last 10 years, iOS app users have accounted for about 50% of the time smartphone app users spend online. (Ex. Expert 1 (Evans) ¶ 79.) iOS also accounts for a significant share of spending on apps. Between 2015 and 2019, iOS accounted for 50-52% of spending globally, excluding China, and 57-60% of spending in the U.S. (Ex. Expert 1 (Evans) ¶ 80; PX-1057.) Apple also has over "50 percent of phone sales by revenue in the U.S." (Evans Trial Tr. 1494:11-18; PX-1061.)

174. Several structural features of the smartphone operating system market confirm Apple's market power:

- a. Apple's sole competitor in the relevant market is Google's Android (Evans Trial Tr. 1492:4-9);
- b. There have been no successful new entrants since 2008, and even well-funded entrants like Microsoft have tried and failed to enter (Evans Trial Tr. 1493:12-1494:10; Ex. Expert 1 (Evans) ¶¶ 90-91);
- c. A new entrant would face significant barriers to entry, such as the cost of developing a smartphone OS, the challenge of convincing phone manufacturers to adopt the OS, the challenge of persuading developers to create software for the platform, and the challenge of persuading consumers locked into iOS or Android to switch to a new smartphone OS (Ex. Expert 1 (Evans) ¶¶ 90-91);
- d. Apple's substantial market share has persisted for over a decade. (Ex. Expert 1 (Evans) ¶ 91; Evans Trial Tr. 1493:12-22.)

175. Google does not constrain Apple's market power. (Evans Trial Tr. 1706:10-16.) There are significant sunk costs and switching costs for consumers that result in minimal switching between platforms. (See Section II.B above; Evans Trial Tr. 1492:19-1493:2; Ex. Expert 1 (Evans) ¶¶ 75-78, 83-88.) Consumers single-home on one platform or the other, because "most smartphone users have either an iOS or an Android [device] but not both". (Schmalensee Trial Tr. 1919:1-7; Evans Trial Tr. 1498:9-16 ("[P]eople are an iOS user or they

are an Android user, but they are not both.”).) Once a consumer chooses iOS or Android, she is locked into that ecosystem because of the difficulty of switching. (*See* Section II.B above.) In the words of Professor Schmalensee, “[c]ompetition for singlehomming customers is a winner-take-all struggle for all of their business, while competition for multihoming customers is competition on [the] margin for a larger share of their business”. (Schmalensee Trial Tr. 1995:6-11.)

176. Similarly, as explained above, because consumers single-home and do not switch, developers do not face incentives to switch between iOS and Android and find it much more profitable to multi-home across both platforms. (*See* Section II.C above; Ex. Expert 1 (Evans) ¶ 48; Evans Trial Tr. 1498:11-22; Athey Trial Tr. 1820:15-1821:2.)

177. Developers view iOS as their monetization platform of choice, as users have a higher propensity to spend on the iOS version of an app compared to its Android equivalent. (Ex. Depo. 7 at 320:4-10, 320:14-22 (Okamoto).)

a. For example, Adrian Ong, Match Group’s Senior Vice President of Operations, testified that █ of Match’s revenue from the popular Tinder app comes from iOS. (Ex. Depo. 1 at 69:17-19, 72:7-10 (Ong)) Mr. Ong also noted that it could not abandon iOS and develop solely for Android. Because iOS has the “majority of the distribution”, leaving the platform would be “extremely destructive”. (Ex. Depo. 1 at 69:20-21, 69:23-70:5 (Ong).)

b. Benjamin Simon, Down Dog's Co-Founder and CEO, also testified that roughly 50% of Down Dog's revenue comes from iOS subscribers, 35% from Android subscribers and the rest from the web and other platforms. (Simon Trial Tr. 391:14-18, 401:8-15.) Mr. Simon noted that Down Dog cannot abandon iOS, as there "is no other way for [Down Dog] to allow [their] users to access any iOS app". (Simon Trial Tr. 390:23-25, 393:21-394:12.)

178. Apple's market power is further shown by the fact that developers have not left iOS even as Apple has required them to comply with unfavorable terms and conditions, including Apple's 30% fee for IAP. (Ex. Expert 1 (Evans) ¶ 199.)

G. There Is an Aftermarket for iOS App Distribution.

179. There is a relevant two-sided antitrust aftermarket for the distribution of apps on the iOS platform. (Evans Trial Tr. 1511:20-1512:2; Ex. Expert 1 (Evans) ¶ 144.)

180. Importantly, while that market is currently captured entirely by Apple's App Store, that result is not pre-ordained, but rather is the outcome of the anticompetitive conduct at issue. But for that conduct, the market would have close substitutes that would compete with Apple's App Store for the provision of distribution services to iOS app developers. By considering the but-for world absent Apple's conduct, Dr. Evans determined which distribution channels for iOS apps would be in the relevant market. (Evans Trial Tr. 1510:13-1511:7.) "The iOS app distribution market includes all the channels that consumers and

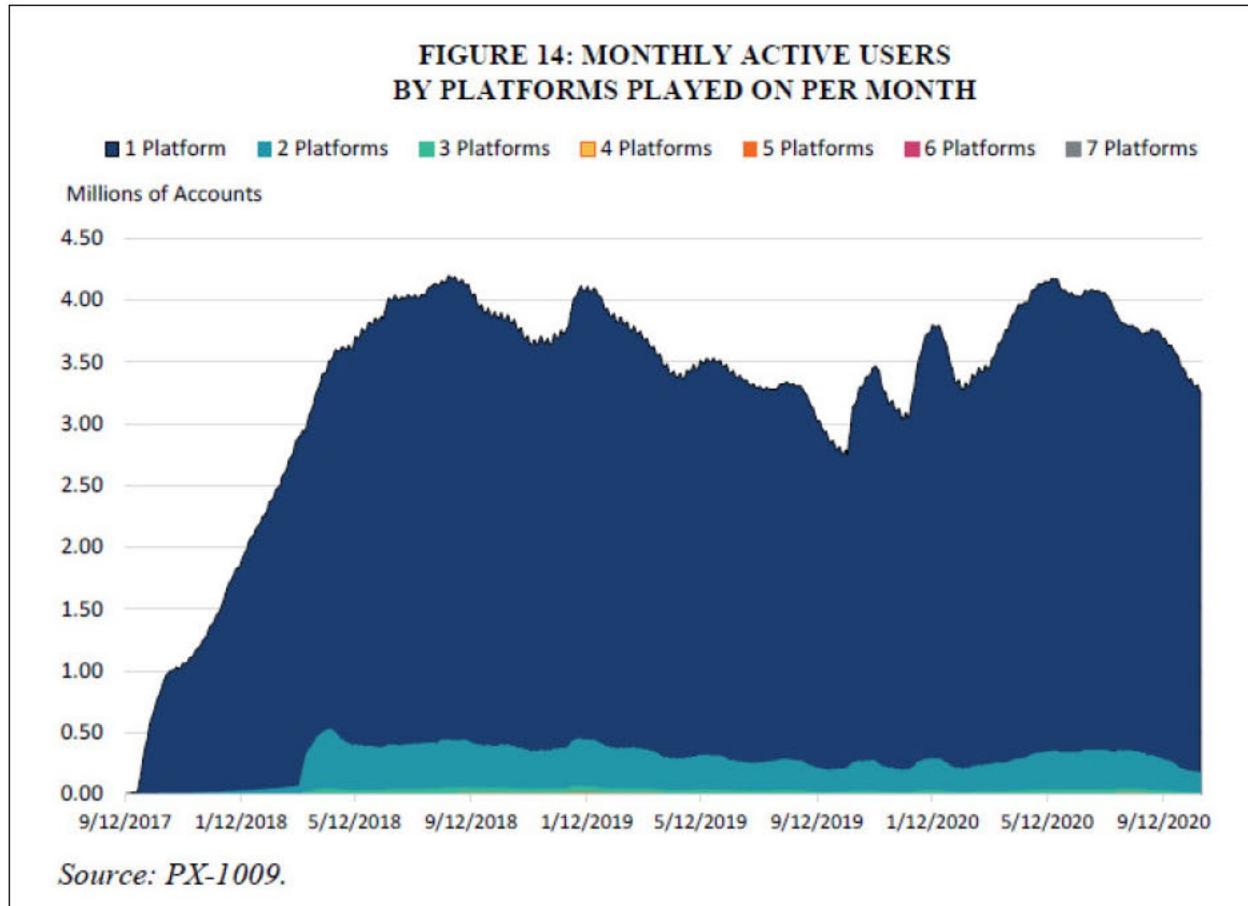
developers would use, and that includes App Stores operating as online marketplaces and direct distribution.” (Evans Trial Tr. 1511:24-1512:2.)

181. Dr. Evans explained that to define a market, the first step is to start “with the supplier at issue” and its product, which in this case, is the App Store and the distribution of apps. Then, any “potential substitutes” for the App Store must be considered that customers would turn to in the event of a price increase in sufficient numbers to constrain the supplier’s market power. (Evans Trial Tr. 1503:19-1504:1, 2387:10-2388:10.)

182. Dr. Evans began by assessing a variety of qualitative factors. As explained above, non-smartphone operating systems are not reasonable substitutes for iOS users or developers, (*see* Sections III.C and III.D), so the app distribution channels for those operating systems are also not reasonable substitutes for distribution channels of iOS apps. And app distribution channels for Android apps are not a significant competitive constraint because users would have to switch devices to make use of those channels and, as described above, (*see* Section II.B), consumers face significant switching costs and typically do not switch between smartphone ecosystems.

183. Dr. Evans conducted a study of *Fortnite* data, the results of which revealed that about 82.7% of all users single-home and only played on one platform. (Evans Trial Tr. 1516:8-17; Ex. Expert 1 (Evans) ¶ 126.) Users who only play *Fortnite* on iOS account for over 60% of all minutes played on iOS. (Evans Trial Tr. 1516:22-1517:15.) Developers cannot reach these users through any other platform and therefore must be where these users are. (Evans Trial Tr. 1460:11-16.)

184. The lack of substitutability between mobile and other devices is evidenced by data about *Fortnite* player usage on different devices. *Fortnite* data show that 64.1% of *Fortnite* iOS users—over 73 million people—have accessed *Fortnite* exclusively on iOS devices. (Ex. Expert 6 (Hitt) ¶¶ 62, 71, Figure 13 (64.1% of 115 million iOS users).) From March 2018 through July 2020, Epic earned at least \$500 million in *Fortnite* on iOS, and iOS *Fortnite* users who only ever transact on iOS represent about two thirds of Epic’s iOS revenue. (Ex. Expert 6 (Hitt) Figure 14 (\$745 million in total revenue for users who made purchases in *Fortnite* on iOS); Hitt Trial Tr. 2172:9-25 (roughly two thirds of spending by iOS users on *Fortnite* only ever transacted on iOS).) And in any given month, the vast majority of *Fortnite* players play and transact on a single device—eight times as many as the number of players who play on more than one device. (Cragg Trial Tr. 2264:23-2265:7 (noting that “the vast majority of people sign in to *Fortnite* on a single device each month”); Ex. Expert 13 (Cragg) ¶ 89, Figure 14.)



185. In order to understand consumer and developer switching between iOS and other platforms, including consoles, Dr. Evans analyzed data relating to *Fortnite* usage. (Evans Trial Tr. 1513:10-25.) Dr. Evans concluded that only 16.7% of the gameplay minutes that would have occurred in the iOS *Fortnite* app absent the removal of *Fortnite* on August 13, 2020 shifted to other platforms. (Evans Trial Tr. 1525:2-7; PX-1080.) This analysis demonstrates a very low level of switching between iOS and other platforms. (Evans Trial Tr. 1525:8-16.) The 16.7%, however, is a conservative estimate, as some natural cross-progression to consoles and PCs would have occurred, for example because people become more

serious gamers. (Evans Trial Tr. 1526:3-1527:4.) Therefore, taking into account the natural cross-progression, the amount of substitution fell to 3.1%. (Evans Trial Tr. 1527:10-14.) This result is additionally conservative because the removal of *Fortnite* from the App Store was a significant degradation in quality; it was a more significant change than a typical 5-10% SSNIP. (Evans Trial Tr. 1527:20-1529:21.)

186. To then evaluate whether developers would remain on iOS despite a price increase or degradation in quality or whether developers would abandon the platform, Dr. Evans conducted the same analysis as described above with respect to gameplay minutes, but looking instead at whether iOS *Fortnite* users would substitute their spending to other platforms such that the developer would recoup a sufficient amount of its iOS revenue on other platforms. (Evans Trial Tr. 1532:23-1533:25.)

187. Dr. Evans began by calculating Apple's "effective" commission using Apple's transactional data and arrived at 27.7% for 2019. (Ex. Expert 1 (Evans) ¶ 157.) Dr. Evans then conservatively determined that if Apple raised its effective commission by 10%, developers would pass through to consumers 50% of the price increase. (Ex. Expert 1 (Evans) ¶ 136.) Dr. Evans calculated the spending that would have to shift from the iOS *Fortnite* app to *Fortnite* on other platforms in order for Epic to find it profitable to leave the iOS platform. (Ex. Expert 1 (Evans) ¶ 133.) He then demonstrated that it would not be profitable for Epic to leave iOS unless it could recoup at least 87.7% of its iOS *Fortnite* revenue from other platforms. (Ex. Expert 1 (Evans) ¶ 133.) As Dr. Evans demonstrated, when Epic left the iOS platform, it recouped no more than half of its iOS revenues, on the high end, which means that Epic would

find it more profitable to pay a 10% increase in price than to leave iOS. (Ex. Expert 1 (Evans) ¶ 133.) Developers therefore would not abandon iOS in the face of a price increase or degradation in quality because it would not be profitable to do so. (Evans Trial Tr. 1534:1-6; PX-1079.)

188. Analyzing *Fortnite* is conservative because it is already available on a number of platforms. (Evans Trial Tr. 1534:10-24; Ex. Expert 1 (Evans) ¶ 131; Ex. Expert 13 (Cragg) ¶ 52.) Other developers, such as Uber, that did not invest in other platforms, would find it even more unprofitable to abandon iOS in the face of a price increase or a degradation of quality. (Evans Trial Tr. 1534:25-1535:7.)

189. Dr. Evans's finding is confirmed by a consumer survey conducted by Professor Rossi. Professor Rossi surveyed 2,595 iOS users who had spent money on in-app purchases or subscriptions ("at-issue purchases") in the most recent 30 days, which he chose in order to ensure "the quality of the data". (Rossi Trial Tr. 2508:7-18, 2528:21-24; Ex. Expert 3 (Rossi) ¶ 39.) The final formulation of the survey questions was a culmination of multiple rounds of pretesting. Through the iterative process of pretesting and updating survey drafts, Professor Rossi determined that he had sufficient information to support that the final changes to the survey would be well-understood and would address the issues raised during the multiple stages of pretesting. (Rossi Trial Tr. 2548:4-11; Ex. Expert 3 (Rossi) ¶ 20; PX-1918; PX-1919; PX-1920.) Professor Rossi did not include paid app downloads in his definition of at-issue purchases because they make up less than 2% of App Store revenue, and therefore doing so would not have "materially affect[ed] any of [his] conclusions." (Rossi Trial Tr. 2546:3-10; PX-

2367.2-3). In conducting his survey, Professor Rossi constructed a hypothetical scenario in which he asked iOS users who make their own spending decisions how they would react to a “long run or non-transitory [5 percent] price increase” of at-issue purchases. (Rossi Trial Tr. 2510:13-2511:14; Ex. Expert 3 (Rossi) ¶¶ 7, 15; PX-2547.1-43.) Of these iOS users (who did not answer “unsure”), 81% stated that they would have made the same at-issue purchases if the cost of the digital content had been 5% higher. (Rossi Trial Tr. 2516:15-2517:2; Ex. Expert 3 (Rossi) ¶ 41; PX-1088.1; PX-2545.) The remaining 19% of iOS users (who did not answer “unsure”) stated that they would have decreased their spending. (Rossi Trial Tr. 2516:15-2517:2; Ex. Expert 3 (Rossi) ¶ 41; PX-2545.) Overall, respondents stated that they would decrease their spending by approximately 11% in response to the 5% price change, which translates to a demand elasticity of -2.19. (Rossi Trial Tr. 2517:10-14; Ex. Expert 3 (Rossi) ¶ 44; PX-1090.1; PX-2545.) Notably, only 1.3% of survey participants from these two groups reported that they “would have switched from their current iOS device (iPhone or iPad) to a non-iOS device in response to the price increase”. (Rossi Trial Tr. 2517:3-10; Ex. Expert 3 (Rossi) ¶¶ 12, 43; PX-1089.1; PX-2545.) Professor Rossi used multiple sources of external data to provide affirmative evidence of the representativeness of his survey population, thus bolstering the reliability of his survey results (Rossi Trial Tr. 2521:3-22; Ex. Expert 3 (Rossi) ¶¶ 46-50; PX-1085.1; PX-1086.1; PX-1087.1; PX-1091.1; PX-1092.1.)

190. Dr. Evans used Professor Rossi’s survey data to show that 74% of spending-weighted respondents would not have changed their spending behavior at all if their transaction costs increased by 5%, while just 1.4% of consumers would have switched to a new

non-iOS device. (Ex. Expert 1 (Evans) ¶¶ 136-137; PX-1078.) Based on these results showing that consumers are not particularly responsive to increases in prices for iOS app distribution, Dr. Evans determined they have relatively inelastic demand. (Evans Trial Tr. 1650:17-1651:6; Ex. Expert 1 (Evans) ¶ 137.) Professor Rossi's survey confirms Dr. Evans's finding that consumers have relatively inelastic demand for iOS app distribution and that very few consumers would respond to a price increase by switching to Android. (Evans Trial Tr. 1650:17-1651:6.)

191. To confirm the existence of the iOS app distribution market, Dr. Evans performed a SSNIP test. (Ex. Expert 1 (Evans) ¶¶ 139-144.) He began by calculating the App Store's "effective" commission rate, which was 27.7% in 2019, based on transaction data produced by Apple. (PX-1050; Ex. Expert 1 (Evans) ¶ 157; *see* Ex. Expert 6 (Hitt) ¶ 179.) Assuming developers pass on 50% of their costs to consumers, Dr. Evans analyzed whether the price increase from Dr. Rossi's survey would be profitable for Apple; this 5% increase in consumer-facing prices would amount to a 30% increase in the App Store's commission, from 27.7% to 35.9%. (Ex. Expert 1 (Evans) ¶¶ 136, 141; Evans Trial Tr. 1669:3-7.) Dr. Evans found that if Apple raised its App Store commission by this amount, it could have increased its profits by \$824.9 million in 2019. (Ex. Expert 1 (Evans) ¶ 141.)

192. In theory, Apple, as the monopolist, should already be charging the highest commission rate it can and should not be able to increase fees more, but in practice, it is likely that Apple has not increased its commission rate over the current 30% maximum given the high level of regulatory, media, and developer scrutiny it has faced for several years. (Ex. Expert 1 (Evans) ¶ 142.)

H. Apple Incorrectly Defined the Relevant Market as the Market for Digital Games Transactions.

193. The economic experts who testified for Epic and Apple agree that “[t]he general role of market definition in antitrust matters is to identify competitive constraints relevant to the conduct at issue”. (Lafontaine Trial Tr. 2031:1-9; Ex. Expert 1 (Evans) ¶ 32; Evans Trial Tr. 1453:5-11; 1503:19-1504:1, 2387:10-2389:23; Schmalensee Trial Tr. 1941:1-5.) Both sides’ economic experts also agree that “the definition of a market has to begin with the product around which we look for substitutes.” (*See, e.g.*, Lafontaine Trial Tr. 2004:9-12, 2005:15-21.) In defining the relevant product market, however, Apple’s experts ignored these basic principles.

194. In their testimony and reports, Apple’s experts repeatedly emphasized that the App Store sells a single product: transactions. (*See, e.g.*, Ex. Expert 8 (Schmalensee) ¶ 136 (referring to the App Store as a “transaction platform . . . that supplies one product—transactions”).) Professor Lafontaine testified that “[t]he apps are not the product here . . . The transactions are the product.” (Lafontaine Trial Tr. 2031:25-2032:3, 2037:15-16). And Professor Schmalensee testified that the relevant product is the “transaction service” the App Store provides by bringing together developers and consumers, and “the transaction services that are provided by the App Store are the same services whether the developer sells games or music or coffee or crocheting materials.” (Schmalensee Trial Tr. 1954:3-1955:23 (agreeing that “that transaction service . . . has nothing whatsoever to do with the content that the developer then provides to the user”).)

195. Notwithstanding their assertion that the App Store sells the same transactions to all developers, Apple’s proposed “digital game transactions” product market does not focus on the product Apple sells, but on a product invented by its economists specifically for this litigation and tied to the identity of the plaintiff, Epic. (Schmalensee Trial Tr. 1943:18-1944:1 (agreeing that “if there were a different plaintiff [in the case] who was not a company that developed game apps, it is possible . . . that [he] would come to a different conclusion as to the proper market definition.”).) Their analysis focused on Epic, and just one of Epic’s products: *Fortnite*. (Lafontaine Trial Tr. 2005:24-2006:3 (“[C]onduct is not a product and therefore consumers don’t consume the conduct. So what we need to look at is what is the product that’s affected by the conduct.”), 2030:10-17 (noting that defining a relevant market does not begin with the conduct), 2046:16-2047:9 (“Q: And when you formed your opinion, you did not know that Epic was the developer of the *Houseparty* app, correct? A: That’s correct.”); Hitt Trial Tr. 2126:23-25 (“[T]he framework I used—and I relied heavily on Professor Lafontaine—is to look for substitutes for performing digital game transactions.”). Documents in evidence and Apple’s witnesses repeatedly refer to app distribution, (e.g., PX-877; Schiller Trial Tr. 2728:24-2729:10 (describing what the App Store offers as “app distribution”), 2748:1-13 (“There are many, many competitors for app distribution.”), but there are no documents referring to digital game transactions or game transaction platforms, which are litigation-driven concepts.

196. The App Store provides distribution services to all apps, and these are the same distribution services regardless of the service the app then provides to consumers. (Evans Trial Tr. 1454:11-16; 1457:10-1458:25; 1707:2-17; Schmalensee Trial Tr. 1955:3-23.) The

challenged conduct in this case is therefore not specific to Epic or game apps; Apple's conduct applies to all iOS app developers and potential iOS app distributors. (Evans Trial Tr. 2448:5-2449:21; Ex. Expert 1 (Evans) ¶ 39; Ex. Expert 16 (Evans) ¶¶ 11-14; Ex. Expert 13 (Cragg) ¶ 15.)

- a. If Apple's market definition were correct, two lawsuits challenging the same conduct by the same defendant could result in different product markets and different findings about the defendant's liability. (Evans Trial Tr. 1744:17-19 (stating that the market does not depend on the plaintiff), 2387:10-2389:23 (explaining why the plaintiff-centric approach to market definition is flawed); Hitt Trial Tr. 2189:17-22; *see also* Lafontaine Trial Tr. 2033:11-23.)
- b. Professor Hitt, for example, agreed that if the very same allegations were made by Spotify, the market definition would be different. (Hitt Trial Tr. 2189:17-22 (agreeing that "if Spotify brought the same complaint with the same allegations, that would require a different market analysis"); *see also* Lafontaine Trial Tr. 2033:11-23 (asserting that the plaintiff's product "determines what the market definition is").)
- c. Professor Schmalensee conceded that if this same lawsuit were brought by a large group of app developers that make different types of apps, one might want to consider the possibility of

multiple relevant markets by considering differences between apps.

(Schmalensee Trial Tr. 1944:14-20.)

- d. Professor Schmalensee also testified that if the Department of Justice brought a lawsuit challenging the same conduct as Epic, he would “consider the possibility of a market of all apps or of multiple categories of markets”. (Schmalensee Trial Tr. 1944:21-1945:5.)
- e. Dr. Lafontaine, another of Apple’s experts, had never heard of Epic’s *Houseparty* app and failed to review a list of Epic’s apps before determining that the relevant product market is for digital game transactions. (Lafontaine Trial Tr. 2046:16-2048:6.) Professor Hitt, conversely, *did* know about both *Houseparty* and Epic’s *Unreal Engine* apps when defining the relevant market, yet he did not consider them, even though he acknowledged the relevant market *must* include all relevant products. (Hitt Trial Tr. 2187:17-20, 2190:10-2191:15.)
- f. Professor Schmalense also testified that *if* Epic were “suing in its capacity as a distributor of apps”—which, in fact, Epic is doing—“the relevant market would be . . . the market for being an app store”. (Schmalensee Trial Tr. 1945:18-1946:10, 1947:14-21.)

g. Finally, Professor Schmalensee testified that if Epic offered a portfolio of game and non-game apps, that “might lead to a different ultimate outcome than where [he] landed in this case”. (Schmalensee Trial Tr. 1945:9-14.) Notwithstanding Professor Schmalensee’s concession that “Epic does do both game apps and non-game apps, of course”, the analysis performed by Apple’s experts focused exclusively on game transactions. (Schmalensee Trial Tr. 1945:9-14.)

197. In fact, Epic *does* offer a portfolio of game and non-game apps, a fact Apple’s experts either did not consider or affirmatively ignored in formulating their market definition. For example, in her market definition analysis, Dr. Lafontaine did not consider any non-game app Epic develops, including *Houseparty*, and also did not consider any non-game apps developed using Epic’s *Unreal Engine*. (Lafontaine Trial Tr. 2047:4-2049:18.) Similarly, Professor Hitt admitted that when he decided to focus his analysis exclusively on games, he was aware that “*Houseparty* is a social app which would not be within the games market” he defined and that Epic’s *Unreal Engine* apps “are not games . . . they are essentially DevTools” that are “used for media content generation”. (Hitt Trial Tr. 2190:10-2191:15.) Professor Hitt conceded that as between the two market definitions before the Court, Epic’s and Apple’s, only Epic’s market actually includes Epic’s non-game apps. (Hitt Trial Tr. 2192:20-25 (“Q: You agree with me, sir, that as between the two market definitions before the Court, Epic’s and Apple’s, only

Epic's market actually includes [*Houseparty* and the *Unreal Engine* apps], correct? A: Yes.

Houseparty is outside the games transaction market. So that would be yes.”).)

198. By focusing exclusively on Epic and *Fortnite*, Apple's experts, “working together”, concluded that the relevant market is for a specific type of transaction: digital games transactions. (See Lafontaine Trial Tr. 2051:17-24; Ex. Expert 7 (Lafontaine) ¶ 1.)

Dr. Lafontaine claims it is appropriate to bifurcate the market between game and non-game transactions because game transactions face different competitive conditions than non-games do. (Lafontaine Trial Tr. 2041:18-24.) But, according to Dr. Lafontaine, it is inappropriate to further sub-divide the game transactions market because game transactions constitute an “intuitive and natural grouping”, even though “there are different competitive conditions that are applicable to different games”. (Lafontaine Trial Tr. 2042:3-2043:20.)

199. The Apple experts’ “intuitive and natural grouping” includes, according to Dr. Lafontaine’s testimony, “transactions on a game console, but only if they are digital transactions, but not digital transaction for something other than games, and [not] retail transactions for products to be used with game consoles.” (Lafontaine Trial Tr. 2052:25-2053:7.) Dr. Lafontaine’s market was based in part on “what [she] understood the law would require”. (Lafontaine Trial Tr. 2053:23-2054:3.)

- a. However, Microsoft does not view game transactions in Apple's App Store to be in competition with game transactions in the Xbox Store, which is Microsoft's digital marketplace for Xbox console games. (Wright Trial Tr. 547:4-9, 549:14-21.) It is not an

“either/or choice”—that is, a user is “not playing one at the expense of another”. (Wright Trial Tr. 549:14-21, 643:18-24.) With respect to Sony’s PlayStation, on the other hand, “if you made a choice to buy a PlayStation, then you’re buying games from Sony. That is taking away from you being an owner of an Xbox for the most part and buying games through the Xbox Store.” (Wright Trial Tr. 548:12-18.)

- b. Further, Ms. Wright testified that, in connection with planning its business development strategy, Microsoft does not consider the scenario in which a user playing a game on a non-Xbox platform sees an in-game item that he wants to purchase, stops playing the game on the non-Xbox device, moves to his Xbox (or a friend’s Xbox) to make the purchase, and then returns to the non-Xbox device to continue to play the game with the item purchased on the his (or a friend’s) Xbox. (Wright Trial Tr. 550:18-551:6.)
- c. Because of these differences, the distribution of apps on game consoles is not in the same market as distribution of apps on an iOS device. (Evans Trial Tr. 1459:5-9.) For a consumer who owns both a smartphone and console, purchases made on the console are not made in lieu of purchases on iOS. (Evans Trial Tr. 1506:15-1507:2.) To use that purchase on the iOS app, the

consumer must download the app from the App Store. (Evans Trial Tr. 1506:23-1507:2.)

200. Apple claims that the fact that consumers cannot substitute “zombie game[s]” with the purchase of “graphing calculators” demonstrates that the iOS app distribution market is incorrectly defined. (*See, e.g.*, Evans Trial Tr. 1642:16-18 (“Q. In your view, is a download transaction from the App Store or Call of Duty: Black Ops – Zombies a substitute for download transaction of the Graphing Calculator Plus app?”), 1706:20-22.) However, this position lacks merit. As noted, Apple’s position in this litigation (and Epic’s) is that the App Store sells a single product: transactions. (*See, e.g.*, Ex. Expert 8 (Schmalensee) ¶ 136 (referring to the App Store as a “transaction platform . . . that supplies one product—transactions”); *see also* Ex. Expert 8 (Schmalensee) ¶ 24 (“Apple’s App Store exists to facilitate transactions between members of these two groups.”).) When a developer sells a zombie game or a digital graphing calculator through the App Store, the product or service Apple provides is the facilitation of their transaction. The market here is the market for distribution services that facilitate consumers obtaining iOS apps and facilitate iOS app developers reaching consumers. (Evans Trial Tr. 1707:2-17.) Those distribution services are the same for any and all apps.

201. The transactions Apple’s experts identify for their market are app downloads, app updates and in-app purchases. (Lafontaine Trial Tr. 2057:14-17.) Although Dr. Lafontaine testified that the market is defined by identifying substitute products (Lafontaine Trial Tr. 2004:9-12), she conceded that only one of these three transactions—in-app purchases—can be completed on a non-iOS device. (Lafontaine Trial Tr. 2057:18-2059:17.) Dr. Lafontaine

agreed that “there is literally no competition” for downloading and updating iOS apps “other than to [complete these transactions] on the iPhone”. (Lafontaine Trial Tr. 2059:4-7.)

202. Importantly, Apple’s experts’ narrow articulation of a market for “digital game transactions” also led them to ignore crucial parts of Epic’s allegations, including those relating to the entry of the Epic Games Store on iOS. (Hitt Trial Tr. 2191:20-23 (“Q: You remember you told me in your deposition that you’ve personally not analyzed the allegations related to the entry of the EGS? A: That’s correct.”).) In fact, Professor Hitt admitted at trial that there are transactions implicated by Epic’s complaint and subject to Apple’s anticompetitive conduct, such as when a user obtains a non-game app on the Epic Games Store, that are outside of the Apple’s experts’ defined market. (Hitt Trial Tr. 2191:24-2192:2 (admitting when asked whether a user obtaining a non-game app from the Epic Games Store are digital game transactions, “It’s a digital transaction, but not a game transaction. So that would be no.”).)

203. According to Dr. Lafontaine, iOS users could substitute making digital game transactions on their personal iOS devices with making digital game transactions on a friend’s video game console. (Lafontaine Trial Tr. 2059:21-25.) She believes that “[i]n some situations”, going to a friend’s house to purchase digital content on the friend’s video game console would be a good substitute for purchasing digital content on a user’s own smartphone. (Lafontaine Trial Tr. 2060:18-22.) Dr. Lafontaine presented no evidence about users’ ability or willingness to engage in that kind (or any kind) of substitution.

204. Professor Hitt admitted that developers are “highly incentivized” to encourage users to transact outside of the App Store because they would avoid Apple’s 30%

commission. But he presented no evidence that any game developers were trying to encourage substitution. (Hitt Trial Tr. 2195:15-2196:19.)

205. According to Professor Hitt, of the Top 25 iOS games by revenue and download, at most four—or 16%—are also available on consoles. (Hitt Trial Tr. 2200:13-2201:18.) Although Professor Hitt claimed in his written testimony that 72% of the Top 25 iOS games by revenue and 88% of the Top 25 iOS game by download are available on PCs (Ex. Expert 6 (Hitt) ¶ 31, Figure 3), those figures were shown in Court to be demonstrably false. Once he took the stand and failed to reproduce his study during a live demonstration, Professor Hitt admitted that the developers of at least eight of the games he had identified as available on PC claim to be selling their games only on mobile platforms, and he was unable to show that any of these games were available on PC from the same developer. (Hitt Trial Tr. 2207:6-2216:11.) Professor Hitt suggested that perhaps “comparable” games from other developers were available on PC. But he pointed to no such games in his reports or testimony, and he conceded that “comparable games from a different developer” do not help the *bona fide* mobile developer avoid Apple’s 30% commission. (Hitt Trial Tr. 2238:2-7.)

206. Following his cross examination, Apple struck Professor Hitt’s disproven study from his written testimony. (Ex. Expert 6 (Hitt) ¶¶ 30-31.) In light of the fact that Professor Hitt’s iOS app availability study was shown to be demonstrably false, Dr. Cragg’s study on iOS app availability is the only legitimate study on this topic in the record. (Ex. Expert 13 (Cragg) ¶ 79, Figure 10.)

207. Dr. Cragg's analysis showed that the vast majority of the most popular games on mobile platforms are typically available *only* on mobile platforms, while games designed for consoles and PCs ("static platforms") are available *only* on console or PC—not on mobile devices. (Ex. Expert 13 (Cragg), Figure 10 (18 of the top 30 mobile games only available on mobile).) Importantly, Dr. Cragg showed that only *one* game, Minecraft, was as available on as many different platforms as *Fortnite*. (Ex. Expert 13 (Cragg), Figure 10.) Because Apple's experts focused on *Fortnite*, they used their *easiest* test case for finding actual substitution of gaming transactions across platforms. That they presented no evidence of actual meaningful substitution, even with respect to *Fortnite*, the easiest test case, makes substitution "unlikely to hold true for the other games where the same type of play opportunity doesn't exist". (Cragg Trial Tr. 2268:14-2269:6.)

208. Professor Hitt also failed in Court to verify his claim that iOS users can make "direct purchases of content through a web browser on the iOS device", such as the iOS Safari web browser, "for content that can be accessed in an iOS app". (Ex. Expert 6 (Hitt) ¶ 51.) Professor Hitt conceded that only two games out of the top 25 iOS games by download offered purchases through Safari on an iPhone, but claimed that he had identified eight games, out of the populations of top 25 iOS games by revenue, where a user purportedly could make purchases on the Safari browser and then use those purchases within the native iOS app. (Ex. Expert 6 (Hitt) ¶ 51, Figure 8.) That claim too was demonstrably false. When asked whether he could explain how to make a purchase outside of several of these eight apps, Professor Hitt admitted that this was something he had "not personally" attempted before appearing in Court, except for *Fortnite*.

(Hitt Trial Tr. 2219:6-12.) A live demonstration revealed that *Candy Crush*, one of the games Professor Hitt had identified as offering purchases through Safari on iOS, was available only from the App Store or “on desktop”, not mobile, contrary to the representation in Professor Hitt’s written testimony (Hitt Trial Tr. 2219:20-2221:2). Professor Hitt also conceded that the developer of another game, *Clash Royale*, represents that purchases are *only* available through the App Store. (Hitt Trial Tr. 2221:23-2222:19.) And Professor Hitt could not confirm under oath that other games he had identified as offering portable purchases actually give consumers the option to purchase content on a web browser on an iOS device and take those purchases back to the iOS app. Professor Hitt was unable to provide the Court with “any logical explanation” for his inability to demonstrate the availability of cross-platform purchases in the games he had testified in writing as offering that functionality.⁵ (Hitt Trial Tr. 2228:18-2229:6.)⁶

⁵ In light of Professor Hitt’s demonstrably false testimony in this regard, on May 16, 2021, Apple attempted to retroactively change Professor Hitt’s written direct testimony to say that the eight apps he had identified offer users the ability to purchase currency through *some* web browser, and not necessarily through a web browser on the iOS device. The Court denied Apple’s request to change the testimony. But notably, this proposed revised testimony was already proven to be false in court. For example, as noted above for *Clash Royale*, the developer website makes clear that the developer, Supercell, “do[es] not store any credit card information related to in-game purchases, as the payment transactions are completed through Apple’s App Store or Google Play”, and not on any web browser. (Hitt Trial Tr. 2221:23-2222:19.)

⁶ Following Apple’s attempt to retroactively change Professor Hitt’s testimony about purchasing game currency through web browsers, Apple attempted again to rehabilitate Professor Hitt’s testimony by having a fact witness, Mike Schmid, testify to the ease of the process with which a user could buy in-game currency on an iOS web browser. Mr. Schmid attempted to do this via video demonstratives in court. Mr. Schmid’s demonstratives omitted various steps associated with purchasing in-game currency—such as creating a developer account, logging in to that account, and entering payment details—and Mr. Schmid admitted that a user would have to give up Apple’s touted Sign In With Apple privacy and security protections

209. None of Apple’s three experts who testified on market definition in this case conducted a hypothetical monopolist test or SSNIP test to disprove Epic’s market definition or to prove an alternative market definition. (Schmalensee Trial Tr. 1929:3-22; Lafontaine Trial Tr. 2050:12-2051:22; *see also* Lafontaine Trial Tr. 2019:17-20 (acknowledging that a SSNIP test “can be a very informative piece of information” and that it “is a useful test to determine the boundaries of the markets, obviously”); Hitt Trial Tr. 2185:18-2186:3.) While Professor Schmalensee testified that Professor Lafontaine performed a hypothetical monopolist test, Professor Lafontaine testified that she did not. (*Compare* Schmalensee Trial Tr. 1929:7-25 (Q. [Y]our understanding is that [Professor Lafontaine] performed a hypothetical monopolist test; correct? A. To the extent that the facts in the record permitted her to do that, she attempted to do that.”), *with* Lafontaine Trial Tr. 2050:15:2051:13 (“Q. You also did not do a hypothetical monopoly test either, correct? A. . . . I would say I did not.”))

210. Professor Lafontaine opined that “market definition is fundamentally about demand substitution—whether customers are willing and able to substitute if terms of trade worsen, including if quality decreases or price increases.” (Ex. Expert 7 (Lafontaine) ¶ 20). In offering her opinions in this matter, Professor Lafontaine relied on the results of two surveys conducted by Apple’s survey expert, Professor Hanssens. (Ex. Expert 7 (Lafontaine) ¶ 54). But Professor Hanssens, who did not speak to Professor Lafontaine at all in connection with this

to accomplish what he had accomplished in the *Candy Crush* video. Mr. Schmid also admitted that in order to purchase the currency on an iOS device web browser, a user would have to activate a non-default setting on the iOS web browser that tricks a website into believing that it is being accessed by a PC. (Schmid Trial Tr. 3266:16-3288:5.)

litigation and is not familiar with the market definition work that she did (Hanssens Trial Tr. 3549:24-3550:4), failed to conduct surveys relevant to Professor Lafontaine’s market definition exercise.

- a. Specifically, despite Apple’s counsel’s attempted claims to the contrary (Hanssens Trial Tr. 3594:5-3595:7), Professor Hanssens admitted that his surveys “did not address substitution at all” (Hanssens Trial Tr. 3551:22-23), including (1) “whether respondents have the *ability* to make a substitution to other electronic devices” (Hanssens Trial Tr. 3552:15-18) (emphasis added), (2) “whether respondents are *willing* to use other electronic devices” (Hanssens Trial Tr. 3554:1-3) (emphasis added), (3) “whether respondents have the *desire or the preference* to switch to another device” (Hanssens Trial Tr. 3554:4-6) (emphasis added), or (4) “what respondents would do in response to any set of circumstances”. (Hanssens Trial Tr. 3557:11-13.)
- b. In addition, despite asking respondents about devices available to them to regularly use in the last 12 months, Professor Hanssens “did not ask or try to ascertain the specific use for which that device may or may not be available”, whether it is available for “phone calls or [] any number of things you might do” with electronic devices. (Hanssens Trial Tr. 3556:3-12.)

- c. Moreover, Professor Hanssens' surveys asked about device usage over *the last 12 months*, which he admits "may include devices that respondents [] do not currently use or have access to". (Hanssens Trial Tr. 3553:2-6.) This is relevant because "an individual cannot substitute something for something else if they do not have that something currently available to them". (Hanssens Trial Tr. 3553:10-13.)
- d. Thus, Professor Hanssens' surveys cannot be used to inform Apple's market definition.

211. Even if Professor Hanssens had attempted to inform Apple's market definition exercise, his survey questionnaires themselves also had several issues.

- a. Professor Hanssens performed a pretest of his surveys and received numerous complaints that some of the questions and terms were vague. In particular, he received feedback that "regular use was vague" and "'available to use' was vague". (Hanssens Trial Tr. 3568:12-24, 3572:25-3573:4.) Despite agreeing that "vague wording can introduce error into [survey] responses" (Hanssens Trial Tr. 3567:18-20), Professor Hanssens "did not revise [his] questionnaire at all based on any of [his] pretest responses." He also did not explain in his surveys what was meant by "regularly" (Hanssens Trial Tr. 3568:5-7, 3574:6-8). In fact, Professor

Hanssens admitted it could have meant anything from “daily”, to “weekly”, to “once a year they use the Xbox when their family comes to visit” (Hanssens Trial Tr. 3567:7-11, 3570:15-3571:4).

- b. While Professor Hanssens did provide respondents with an example of what “available to regularly use” would be, it included devices “of a member of your household or *of a friend* that you could have regularly used, but that you did not regularly use in the last 12 months.” (Hanssens Trial Tr. 3555:10-15 (emphasis added).) Professor Hanssens admitted that in this example, the phrase “‘available to regularly use’ includes devices that the individual has *never* used”. (Hanssens Trial Tr. 3573:5-12 (emphasis added).) For example, he agreed that “an old model of a phone sitting in a desk drawer that is not used would qualify as available”, so long as “the phone works”. (Hanssens Trial Tr. 3573:13-16.)
- c. Not surprisingly, Professor Hanssens’s faulty surveys generated demonstrably unreliable responses. Specifically, 30-43% of Professor Hanssens’s survey respondents self-reported regularly using or having available to regularly use a Microsoft Windows smartphone, a device that is no longer sold and in 2018, had a market share of only 0.15%. (Hanssens Trial Tr. 3576:11-

3577:17). Apple’s own data, which Professor Hanssens “did not look at” (Hanssens Trial Tr. 3578:15-18), [REDACTED] [REDACTED]. (DX-4312.178; DX-3084.12, 74) Despite admitting that such results “struck [him] as high” (Hanssens Trial Tr. 3576:20-25), Professor Hanssens included them at face value in his opening expert report and “did [not] acknowledge that there was anything even somewhat surprising about [them]”. (Hanssens Trial Tr. 3578:11-14.)

- d. Professor Mathiowetz, an Epic rebuttal expert, pointed out the flaws in Professor Hanssens’s surveys in her rebuttal report. (Hanssens Trial Tr. 3579:9-11.) Prompted by this critique, Professor Hanssens decided to “exclude[] all of the respondents who indicated that they regularly used or could have regularly used smartphones operating by a Windows Microsoft operating system” when he submitted his written direct testimony. (Hanssens Trial Tr. 3579:4-20.) In other words, Professor Hanssens threw out 30% of respondents for his iOS app survey, and 43% of respondents for his iOS *Fortnite* survey. (Hanssens Trial Tr. 3579:21-3580:5.) This means he threw out 151 of 500 responses to one survey, and threw out 211 of 490 responses to the other. (Hanssens Trial Tr. 3580:10-24.) Despite having no evidence that the remaining

respondents were any less confused—Professor Hanssens concluded that “[his] overall results and conclusions do not change in any meaningful way”. (Ex. Expert 10 (Hanssens) ¶¶ 18-19; Hanssens Trial Tr. 3581:15-21.)

- e. Notably, Apple has continually misrepresented Professor Hanssens’ survey findings to support its proposition that consumers have access to multiple electronic devices that can be used for gaming. For example, Professor Lafontaine testified that Professor Hanssens’ surveys assessed device ownership. (Lafontaine Trial Tr. 2056:21-2057:13). Apple’s own Conclusions of Law state: “[a] survey conducted by one of Apple’s experts revealed that many consumers of game apps do in fact *own* multiple devices and have access to multiple game platforms that are reasonably interchangeable”. (Apple’s May 21, 2021 Conclusions of Law ¶ 358) (emphasis added).) On the contrary, Professor Hanssens has made clear that his surveys assessed device usage, *not* ownership. (Hanssens Trial Tr. 3557:22-24). Moreover, both Professor Lafontaine and Apple’s counsel continually report Professor Hanssens’ survey results regarding device usage in the present tense. (Ex. Expert 7 (Lafontaine) ¶ 54; Hanssens Trial Tr. 3559:11-3562:22). This is misleading because

Professor Hanssens asked respondents about devices they regularly used or had available to regularly use *over the last 12 months*, which he admits may include devices that respondents no longer use or have available to use. (Hanssens Trial Tr. 3553:2-6).

212. Many apps available on smartphones are not available on game consoles. (PX-1069.) More specifically, the “preponderance of” the top iOS games based on revenue and downloads are “not available on game consoles”. (Evans Trial Tr. 1461:21-1462:3, 1462:11-21; PX-1069; DX-3922.23; Ex. Expert 13 (Cragg), Figure 10.)

- a. An internal Apple App Store developer study conducted in May 2017, for example, revealed that just 3% of apps listed on the App Store were also listed on game consoles in the United States. (DX-3922.23.)
- b. Dr. Cragg conducted analysis showing that the most popular games across each of the platforms are typically not available across the mobile platforms (Android and iOS) and the “static” platforms (consoles and PCs). (Ex. Expert 13 (Cragg), Figure 10.) Contrary to the unsupported statements of Apple’s experts, the top games developed for mobile are only available on mobile, and the top games on each of the static platforms are only available on other static platforms.

- c. Professor Hitt, one of Apple’s experts, took the position that *Fortnite* user data demonstrates substitution between iOS and Nintendo Switch. (Ex. Expert 6 (Hitt) ¶¶ 86-93.) Dr. Cragg demonstrated that Professor Hitt’s analysis was flawed, and in fact revealed that the two platforms are complementary—*i.e.*, that users who played *Fortnite* on iOS and then began playing also on the Switch, *increased* both their overall playing time and their playtime of *Fortnite* on iOS, rather than shifting playtime from iOS to the Switch. (Cragg Trial Tr. 2266:4-2268:1; Ex. Expert 13 (Cragg) ¶¶ 25-33.)
- d. Professor Schmalensee, Apple’s lead economist, agreed with Dr. Cragg that Professor Hitt’s conclusion about substitution between iOS and Nintendo Switch was unsupported by his analysis. (Schmalensee Trial Tr. 1934:21-1935:10 (“I don’t think the conclusion he reached about absolute play was supported by the analysis in the text of his rebuttal report.”).) He also agreed that “what Professor Hitt found was there was an overall increase in play and an insufficient basis to find actual substitution from one device to the other”. (Schmalensee Trial Tr. 1935:22-1936:16.)

- e. The data show that only 0.3% of iOS *Fortnite* users even played on the Switch when *Fortnite* first launched on that platform. (Hitt Trial Tr. 2197:25-2198:5.) And as noted above, Dr. Cragg has looked at the data and found that in fact, following the launch of *Fortnite* on Switch, players who played *Fortnite* on both iOS and the Switch actually *increased* their spend on iOS more than iOS users who did not play on the Switch (“from about \$1.75 to [\$]2.25, so a 50-cent increase”), again confirming complementarity. (Cragg Trial Tr. 2280:15-23.)
- f. Dr. Cragg explained that Professor Hitt reached the opposite result erroneously, because he focuses on growth *rate* rather than actual dollar growth in *Fortnite* spending on iOS, thereby obfuscating the disparate amounts spent by Switch players and non-Switch players both before and after the launch of the Switch. (Ex. Expert 13 (Cragg) ¶¶ 53-57.) In addition, Apple argues that Dr. Cragg should have considered a longer period for his analysis, but that goes directly against Prof. Hitt’s own testimony and analysis; Professor Hitt testified that the relevant periods are the months immediately before and after the launch of Switch. (Hitt Trial Tr. 2145:23-4147:17.)

213. Moreover, there is no industry standard definition of what constitutes a “game”. (Weissinger Trial Tr. 1297:25-1298:2 (“Q. In your view, is there an industry standard definition of what could be called a game? A. I don’t think so, no.”); Kosmynka Trial Tr. 1012:1-3, 1015:7-1016:7, 1190:9-16 (“Your Honor, I don’t know if there is an industry word for game. . . And so I think regardless of whether we say Roblox is a game or an app, the same rules apply.”).

- a. Mike Schmid, Apple’s Head of Business Development for Games, confirmed that Apple itself does not draw bright lines between games and non-games. Mr. Schmid first conceded that the “entertainment” category in the App Store and the “games” category are both described by Apple using the words “entertain”, “apps” and “interactive”. (Schmid Trial Tr. 3292:19-21.)
- b. Mr. Schmid then explained that Apple does not view “gamers” as a distinct subset of individuals but, rather, just as “people who enjoy games . . . [who] may also do other things with their phone and have, you know, really important jobs, or they may just be killing time on the bus. That’s a gamer to me.” (Schmid Trial Tr. 3351:3-8.)
- c. When asked what individuals Apple would put in the “gamer category”, Mr. Schmid could only answer that it “depends on the definition” of gamer and when further asked whether Apple does

any analysis whatsoever of user-level revenue from gamers, Mr. Schmid conceded that “we don’t look at the user-level activity, like what does the gamer on our platform generate. We don’t split our users in that same way.” (Schmid Trial Tr. 3351:18-3352:15.)

I. The Geographic Market for iOS App Distribution Is Global Excluding China.

214. The geographic market for the distribution of iOS apps is global excluding China. (Ex. Expert 1 (Evans) ¶ 145.)

- a. Apple treats app distribution as a global enterprise. The same iOS apps appear in storefronts “throughout the world”. (Kosmynka Trial Tr. 985:21-24.)
- b. In the words of Mr. Schmid, the App Store’s business development team “engage[s] with hundreds of developers globally many times a year”, as often as “weekly”. (Schmid Trial Tr. 3221:21-3222:2.)
- c. Apple’s developer rules and guidelines apply globally, to “all storefronts”. (Kosmynka Trial Tr. 985:25-986:24.)
- d. The DPLA applies globally. A developer signs only one DPLA to distribute apps across the world. (Grant Trial Tr. 723:25-724:4 (“Q. [W]as there a separate DPLA signed for each of these territories? A. No. There was just a single agreement. Q. For a global agreement? A. Yes.”).)

215. Apple takes pride in the fact that its products are the same everywhere in the world. As Mr. Cook testified: “We ship the same iPhone in China that we ship everywhere else in the world. It has the same encryption on it. iMessage is the same. FaceTime is the same. And so the product, other than the cloud piece [that is controlled by a Chinese company], is the same.” (Cook Trial Tr. 3970:10-16; *see also* Cook Trial Tr. 3942:18-19, 22 (agreeing that “in China, the iCloud service is operated by a Chinese company”)).

216. The App Store has country-specific storefronts, which restrict where consumers can purchase apps and often what they can purchase. (Ex. Expert 7 (Lafontaine) ¶ 91.) But that restriction is imposed by Apple, rather than by market forces. (Schiller Trial Tr. 2754:20-2755:9 (“It’s how we’ve been told we need to structure the stores.”)).

217. As described above, China restricts developers’ ability to distribute apps within the country, and consumers generally use apps exclusive to China. (Ex. Expert 1 (Evans) ¶ 145.) While Apple makes the App Store available in China, the rules imposed by the Chinese government on Internet activity generally, and app distribution specifically, result in materially different market dynamics in China than those prevailing in the rest of the world. (Ex. Expert 1 (Evans) ¶¶ 71, 108.)

J. The iOS App Distribution Market Is a Properly Defined Aftermarket.

218. The single-brand iOS App Distribution aftermarket is appropriate here due to the “business realities” of the market: there is limited competition in the foremarket because iOS and Android are a differentiated duopoly protected by barriers to entry, Android apps are not a substitute for iOS apps, there are significant switching costs, the costs of app distribution are

low relative to the cost of smartphone devices, and consumers have difficulty assessing lifecycle costs. (Evans Trial Tr. 1507:10-15:10-11, 1512:3-22.) Additionally, between the launch of the App Store and the present, Apple has changed its practices, including by announcing that the App Store commission would just cover the costs of running the App Store and then subsequently reaping enormous profits from the App Store, (*see Sections II.F and IV.C*), and by increasing the price of app distribution by imposing the IAP requirement, extending the IAP requirement to subscriptions and introducing search ads, (*see Sections II.F and IV.C*).

219. Apple's conduct in the aftermarket is not constrained by competition in the foremarket for smartphone operating systems. (Ex. Expert 1 (Evans) ¶¶ 116-118.) As described above, the foremarket is a differentiated duopoly protected by barriers to entry. (*See Section III.F.*)

220. As explained above, once a consumer has chosen a smartphone with a particular OS, he or she is substantially locked in to that OS. For example, there are switching costs that a user would have to incur to switch to a smartphone with a different OS. (*See Section II.B.*)

221. In addition, competition in the foremarket does not constrain Apple in the aftermarket because of the lack of information that consumers have concerning the restrictions and costs associated with app distribution in the aftermarket when they make their choices in the foremarket. That is, consumers commit to a product in the foremarket without a full understanding of the costs and limitations of the aftermarket. (Evans Trial Tr. 1509:11-25; Ex. Expert 1 (Evans) ¶ 118.)

- a. At the time consumers purchase a smartphone, they are unaware of how much they will spend on app or in-app purchases over the full lifespan of the device. Apple does not internally estimate the amount of money a consumer spends on apps over the lifecycle of an iPhone. Nor does it provide consumers with an estimate. (Fischer Trial Tr. 872:7-19; Ex. Depo. 3 at 188:2-9, 188:11-13, 188:25-189:3, 189:5, 189:18-22 (Cue); Schiller Trial Tr. 3071:3-7.)
- b. The price of app distribution is a small fraction of the price of the smartphone itself. This means that even if consumers had better information about lifecycle costs, they would be unlikely to factor it in to their thinking about whether they want to purchase an iOS or Android device. (Evans Trial Tr. 1508:15-1509:25; Ex. Expert 1 (Evans) ¶ 118.)

222. Apple executives are unaware of any consumer that switched away from an iPhone because of the increased cost of an app or the increased cost of an in-app item.

- a. Mr. Cue is not “aware of anyone who has switched from an iPhone to an Android because they perceived there to be some difference in the pricing of apps across the two platforms”. He is not even aware of whether Apple has studied this. (Ex. Depo. 3 at 248:13-20 (Cue).)

- b. Mr. Fischer is similarly not aware “of any instances in which the increased cost of an app has resulted in a user leaving the iPhone system and going to Android”. (Fischer Trial Tr. 870:25-871:3.)
- c. Mr. Fischer is also “not aware of any instance in which the increased cost of an in-app purchase on iOS has resulted in a user leaving the iOS world and instead switching to Android”. (Fischer Trial Tr. 871:4-8.)
- d. Mr. Fischer is also unaware of Apple conducting any study on these subjects. (Fischer Trial Tr. 871:9-872:3.)

223. Apple uses its power over developers to coerce them into accepting its app distribution and in-app payment restrictions. (*See* Section IV.A and VI.D.)

224. In its study of the “foreign exchange equalization process”, Apple has found that demand for apps is “highly inelastic” in the face of changes in price. This is because consumers generally lack actionable information concerning the relative costs of apps and digital content even at the time that they are purchasing that content. (PX-544; Ex. Depo. 12 at 308:13-20, 309:6-11 (Gray).)

- a. Apple requires developers to choose a single “price tier” for each app and in-app digital content; each tier includes both a U.S. price (such as \$.99, \$1.99 or \$2.99) and prices in foreign currency that are intended to be equivalent to the U.S. price. (PX-2202; Ex. Depo. 12 at 206:13-24, 208:6-9 (Gray).)

- b. Because of fluctuations in relative currency values, Apple, in its sole discretion, occasionally recalibrates the non-U.S. prices in each tier to more closely equate to the corresponding U.S. price, which results in decreases or increases in the prices charged in non-U.S. currencies. (Ex. Depo. 12 at 206:13-24 (Gray).)
- c. Apple studied the effect of these price changes in various regions and found that they are “highly inelastic” and do not affect the amount of units sold; “both declines and increases have had minimal impact on units and sizable impacts on billings/revenue”. Apple saw “no material change” and “almost no change in unit sales” even in response to changes as high as 11%. (PX-545.2; (Ex. Depo. 12 at 308:13-20, 315:20-21 (Gray).)
- d. Apple attributed that inelasticity to the fact that “there was not an established price in the customer’s head” at the time digital content was offered. “[D]ue to the diversity of the App Store and the lack of established market expectations for app prices” and the fact that “a customer was generally purchasing something once”, customers lack sufficient information to adjust their purchasing behavior in response to price changes. (PX-545.2; (Ex. Depo. 12 at 309:6-20 (Gray).)

K. App Stores on Other Smartphone Operating Systems Are Not Substitutes for the App Store.

225. As noted above, there are effectively only two smartphone operating systems: Google's Android OS and Apple's iOS, which account for nearly 100% of smartphone OS revenue worldwide. (Evans Trial Tr. 1493:14-22; Ex. Expert 1 (Evans) ¶¶ 74, 118.)

226. Although Apple claims to face numerous competitors, an Apple presentation from 2020 states otherwise: "I wanted to spend a minute talking about COMPETITION for the APP STORE. In years past, we've talked about GOOGLE, MICROSOFT, AMAZON, SAMSUNG, but no we really have ONLY ONE TRUE COMPETITOR, and that's GOOGLE, and their store, GOOGLE PLAY . . ." (DX-4526.31.)

227. Android apps and iOS apps are not substitutes for each other. Android apps do not run on iOS devices. (Ex. Depo. 3 at 63:5-6, 63:8-9 (Cue); Fischer Trial Tr. 873:6-8; Grant Trial Tr. 669:22-24.) Nor do iOS apps run on Android devices. (Grant Trial Tr. 669:22-24 ("Q. Do you know whether or not an app that is developed for iOS will run on the Android platform? A. It will not, no.").) Accordingly, no Android app is distributed through the Apple App Store. (Fischer Trial Tr. 873:3-8.) Users therefore must switch devices in order to access Android apps and app distribution channels, but as noted above, switching costs limit users' ability to substitute between iOS and Android and observed switching rates between iOS and Android are low. (*See* Section II.B above.)

228. This is a single-brand market because distribution channels for Android apps do not provide a significant competitive constraint in the aftermarket or through the foremarket. (Ex. Expert 1 (Evans) ¶ 119.) Even if one considered a two-brand market for iOS

and Android app distribution, Apple would still have substantial market power for the same reasons it has monopoly power in the iOS app distribution market: competition in the foremarket does not constrain Apple's conduct in the aftermarket, and the lack of technical interoperability and the existence of significant sunk and switching costs mean that Android app distribution channels are also not a constraint in the aftermarket. (Ex. Expert 1 (Evans) ¶ 120.)

L. Web App Distribution is Not a Substitute for Native App Distribution.

229. "Native apps" are those written for a particular platform and directly downloaded onto a device. (Grant Trial Tr. 699:16-17 ("A native app would be an application that's created using the SDK for a platform."); Kosmynka Trial Tr. 990:24-991:1 ("Q. So native apps installed from the iOS App Store go directly to the home screen, right? A. Yes.").) On iOS, Apple prohibits consumers from downloading native apps through any channel except the App Store. (Grant Trial Tr. 733:23-25 ("Q. And is sideloading allowed on iOS? A. There are two narrow exceptions, neither of which are permitted for distribution of apps to consumers.").)

230. A web app is an app that is available from a website and utilized on a device through a browser. (Sweeney Trial Tr. 135:1-6.) Whereas native apps "go directly to the home screen" of an iOS device, web apps can be accessed only within a web browser. (Kosmynka Trial Tr. 990:24-991:6.) To get a web app to persist on the home screen on iOS, the consumer would need to access the app through the browser, hit the "share" icon, and then add a link to the web app to the home screen. (Kosmynka Trial Tr. 990:24-991:6.)

231. Web apps have limited functionality compared to native apps. According to the testimony of Mr. Forstall, the Apple executive who led the development of iOS, the

advantages of native apps over web apps are “voluminous”, including that native apps are “faster”, “use less memory” and “can take advantage of native graphics libraries in a way that is either not available or would have to be shoehorned in a web app or a different kind of application”. (Ex. Depo. 4 at 81:17-24 (Forstall); *see also* Ex. Depo. 2 at 249:13-18 (Shoemaker).)

232. Web apps have memory limitations. Whereas native apps can use large portions of an iPhone’s gigabytes of memory, web apps are limited to 50 MB of cache memory on iOS. This restriction severely limits the size of web apps and requires information to be overwritten frequently. (Grant Trial Tr. 705:13-707:7 (testifying that “[w]eb apps have very little access to storage on a device”, and that cache memory is “temporary” because “if the user were to go to a different web app or go to a different application, the OS would reclaim [the cache memory] and it would be gone”).)

233. Browsers need to call on APIs to enable certain functionalities. The APIs available through web browsers are different from, and more limited than, the APIs available to native apps. (Kosmynka Trial Tr. 991:15-992:10; Sweeney Trial Tr. 135:7-12 (“A web app is limited to a set of APIs available within a web browser, which are considerably more limited and thus [less] powerful than the capability available to native apps”); Grant Trial Tr. 701:8-16.)

- a. Specifically, web apps cannot call Apple’s PushKit API, which is Apple’s framework that enables push notifications. (Kosmynka Trial Tr. 991:22-992:3; Wright Trial Tr. 578:9-15; Grant Trial Tr. 701:8-16.) Web apps also cannot call ARKit, Apple’s augmented

reality framework. (Kosmynka Trial Tr. 992:4-10 (“Q. ARKit is an augmented reality framework, correct? A. Yes. Q. [And] ARKit is a native API available to native apps, right? A. That’s right. Q. So ARKit cannot be used by a web app, right? A. That’s right.”); Grant Trial Tr. 703:1-3 (“Q. So WebKit does not have ARKit; is that right? A. It does not have ARKit or any other means of creating AR applications.”).)

234. WebKit is Apple’s web browser engine for iOS. (Kosmynka Trial Tr. 991:7-8.) It is the only web browser engine Apple allows on iOS and is therefore the core software component of all browsers available on iOS. (PX-56 § 2.5.6.) WebKit is responsible for rendering websites and, therefore, web apps on iOS. (Grant Trial Tr. 700:15-17 (“A WebKit is Apple’s set of libraries that they used to build the Safari browser on iOS and Mac.”).)

- a. Apple prohibits developers from modifying WebKit or from adding features to WebKit to enable additional features. (PX-56 § 4.7.)
- b. WebKit does not support certain web APIs available in other web browser engines. Accordingly, web apps on iOS do not have certain functionalities available in web apps on other OSs.

(Kosmynka Trial Tr. 991:15-992:10.) Ms. Wright of Microsoft testified that WebKit “is well-understood to be lacking in some of the features behind other browsers, but because on mobile phones

you can only use WebKit, you don't get the browser competition to move things along". (Wright Trial Tr. 577:24-578:8.)

- c. Apple's Siri assistant does not recognize web apps, even if they are saved on the user's home screen. (Grant Trial Tr. 701:8-16 ("Q. Are there any APIs that you are familiar with that one can access in an iOS native environment that cannot be accessed through WebKit? A. Yes, Access to things like push notifications, to Siri, to health data. Advanced audio features or . . . just certain audio features, ARKit would be another example. So those would be . . . APIs available to native apps but web apps have no – no matching access.").)
- d. Apple's witnesses praised the tools Apple provides to developers. (*See, e.g.*, Schiller Trial Tr. 2895:19-2898:3, 2926:13-16, 2927:13-2930:12.) But many of these tools are not available for web applications. (Schiller Trial Tr. 2935:6-8 ("Q. And the tools you've talked about are not tools that by and large can be used for web apps; correct? A. Correct. Most of these apply to native applications.").)

235. Further, web apps are slower than native apps. Software is composed of a series of commands or code written in one of several languages by humans. The most basic software for any app is referred to as its "source code". (Grant Trial Tr. 676:16-18.)

- a. For source code to be understood by machines, it must be translated into “machine readable code”. (Grant Trial Tr. 683:7-14 (“Q. Are there any steps that have to be taken before code that is in human readable form can be processed by an operating system?
A. Yes. It would have to be translated into a form that the processor for the operating system recognizes. It is usually referred to as compilation, and it takes the human readable version and it crunches it down into an optimized form for the processor.”); 683:19-24.).)
- b. For purposes of this case, that translation can occur in one of two ways: the human readable source code can be “compiled”, or it can be “interpreted”. (Grant Trial Tr. 683:10-14.)
- c. When source code is compiled, it is translated directly by the operating system into the machine-readable language before the app (or software program) is run. (Grant Trial Tr. 684:1-8 (“So to write an app, you would need a means of authoring the human readable code. . . You would need a compiler that would turn your human readable code into a machine optimized version. You would need a way to put the piece of code that generated on a device to execute it.”).)

- d. When source code is interpreted, it is not translated into machine readable language directly but “into a form that is a close approximation of the machine readable form”. (Grant Trial Tr. 708:3-20.)
- e. When source code is interpreted, it takes significantly more time for the operating system to execute a software program or app than it does when the source code is compiled. (Grant Trial Tr. 708:25-709:3 (“Because the human readable code is interpreted as the web app runs; the version that’s produced will be construed as less efficient than a compiler would do for a native app.”).)
- f. Because web apps must send source code through a browser, the code for web apps is interpreted, rather than compiled. (Grant Trial Tr. 708:8-14 (“The human readable code will effectively be provided to the web browser and the web browser or components of the web browser will translate or interpret that code into a form that is a close approximation of the machine readable form. It’s closer to what the process would ideally like, but less efficient than a version being compiled.”).)
- g. The fact that the source code for web apps is interpreted causes web apps to run slower than native apps. (Grant Trial Tr. 708:25-709:6 (“Because the human readable code is interpreted as the web

app runs; the version that's produced will be construed as less efficient than a compiler would do for a native app. The overhead of doing interpretation itself may include additional latency that results in the application performing less well.”).)

h. As Mr. Forstall testified, “because of the architecture [of web apps], [they] sit[] as an extra layer on top of the native layer”, and therefore are “never going to be faster than the native layer”. (Ex. Depo. 4 at 83:14-20 (Forstall).)

236. Apple limits the distribution of web apps on iOS. It does this by preventing native apps from serving as a store or catalog of web apps. (PX-111.2 (“We do not want apps that replace our store with web apps.”).) Apple enacted this policy because its executives were concerned about the competitive threat of third parties—particularly other technology companies such as Facebook, Google and Adobe—accelerating a move to web apps on iOS that would not be subject to Apple’s control and commissions. (PX-886.2 (Schiller: “I understand why FaceBook wants to create a market of 3rd party HTML 5 apps that users run from a native FaceBook app on the iPad If Adobe comes in with an app that links to new web apps that they promote we need to allow that ‘app store’ in, even worse Google could come up with an app that runs all their 3rd party Chrome web apps and we would need to allow that in too! I don’t see why we want to do that. All these apps won’t be native, they won’t have a relationship or license with us, we won’t review them, they won’t use our APIs or tools, they won’t use our stores, etc.”); *see also* PX-2325 (“[O]ur Facebook Gaming app was rejected on

iOS several weeks ago and our subsequent appeal was rejected this week on the grounds that the App Review Board believes that the primary purpose of the app is HTML5 games / code distribution.”; [REDACTED]

[REDACTED]; PX-111.1-2 (Executive Review Board rejecting an app by the name of “The Web Store” because “we do not want apps that replace our store with web apps”).)

237. Apple has not performed any studies or analyses that have “examin[ed] potential performance differences between web apps and native apps”. (Ex. Depo. 3 at 173:5-9 (Cue); *see also* Schiller Trial Tr. 2938: 22-25.)

238. Consumers do not view web apps as adequate substitutes for most native apps. (Grant Trial Tr. 711:4-6 (“[A web app version of *Fortnite*] would just be frustrating, a very poor experience for users, and it would compare extremely badly to other native apps.”); Ex. Expert 1 (Evans) ¶¶ 55-56.)

a. Microsoft’s data shows that users do not generally play games over the web browser on their iPhones; instead, people generally play games on native apps downloaded through the App Store. (Wright Trial Tr. 578:21-25.)

b. A majority of consumers perform many of their online activities exclusively via native apps. (PX-1074; PX-1075; PX-1076.)

c. A 2019 report of 10 countries found that native apps accounted for between 86% and 96% of the time mobile users spent online with only 4-14% coming from using a mobile browser. (PX-1074.)

239. Developers do not view web apps as adequate substitutes for native apps. (Sweeney Trial Tr. 135:8-12 (“A web app is limited to a set of APIs available within a browser, which are considerably more limited . . . than the capability available to native apps, and they also have memory limitations and other constraints applied to them within this web browser environment.”); Patel Trial Tr. 438:11-14; Wright Trial Tr. 577:9-14; Grant Trial Tr. 711:16-18 (“The performance and storage space that *Fortnite* needs and the graphic fidelity make the web app completely unsuitable.”); Ex. Expert 1 (Evans) ¶¶ 60-61.)

a. The ability to create and directly distribute web apps does not lead developers to opt out of distributing native apps through the App Store. (Sweeney Trial Tr. 135:16-17 (“Web apps are not nearly powerful enough to run the modern 3D real-time experience such as *Fortnite*.”).) Apple’s longtime VP of Developer Relations could not name a single developer that “with[drew] their app from the App Store because they [could substitute to distributing] a web app”. (Ex. Depo. 7 at 277:19-22 (Okamoto).)

b. Web apps have limitations and disadvantages that negatively affect the user experience in a way that native apps do not. (Sweeney Trial Tr. 135:8-12; Patel Trial Tr. 430:1-2 (“The native app would

be a better experience for the user.”); Wright Trial Tr. 577:24-578:15; Grant Trial Tr. 699:4-712:15.)

- c. Epic, for example, does not make or distribute a web app version of *Fortnite* because the performance would be materially worse than that of a native application. (Grant Trial Tr. 711:16-18.)
- d. Web apps cannot be located through the App Store search feature, which makes discoverability more difficult as compared to native apps. (PX-56 § 4.7; Patel Trial Tr. 430:4-9, 432:4-11.)
- e. iOS developers that develop web apps must educate users on how to obtain and install the web app, which is significantly more challenging than instructing users to download an application from an app marketplace. (Patel Trial Tr. 431:21-432:11 (“The browser app is four or five steps, which is typically not something an average user would do. . . . On an App Store experience, . . . it’s one click and done.”).)
- f. Support for peripherals—devices that can be attached to a user’s gaming system, like a mouse or a controller—is inferior on web apps as compared to on native apps. (Patel Trial Tr. 437:4-438:3.)

240. Certain apps cannot properly function in web browsers.

- a. Tinder is famous for its “native swiping” user interface, which Match Group invented. (Ex. Depo. 1 at 29:17-23 (Ong).)

- i. Native swiping does not function smoothly (if at all) on web browsers. (Ex. Depo. 1 at 28:24-29:23 (Ong).)
 - ii. Other features of Tinder's native app, such as push notifications, location services, and other aspects of the user interface are unavailable or do not work well on browsers as compared to native apps. (Ex. Depo. 1 at 28:24-30:25 (Ong).)
 - iii. Push notifications are particularly important to app developers like Match Group because they increase user activity and engagement within apps and serve as the main mechanism to notify issuers of new messages and new potential romantic matches. (Ex. Depo. 1 at 31:22-24, 32:1-7, 32:10-12 (Ong).)
 - iv. Match Group, therefore, does not view web browser experiences as a substitute for a native iOS app. (Ex. Depo. 1 at 68:2-5 (Ong).)
- b. Similarly for Nvidia's game streaming service GeForce Now, certain limitations of web browsers negatively affect how it functions as a web app. (Patel Trial Tr. 427:9-428:6, 429:22-430:2, 438:13-14 ("Native apps definitely provide us with more control of the GeForce Now experience."))

- i. For example, the browser bar that typically appears at the top of a webpage may appear while playing a game on a web app, or the game may not register a user’s clicks near the edges of the phone screen. (Patel Trial Tr. 432:22-433:12.)
- ii. Inconsistent frame rates—that is, the inconsistent sending of images to a user’s device—on web apps also result in poor user experience because the user will experience “jitter or stutter where the movement is interrupted.” (Patel Trial Tr. 436:15-17.) On native apps, developers have more control to solve for inconsistent frame rates, which results in a better user experience on native apps than on web apps. (Patel Trial Tr. 436:24-435:3.)
- iii. Web apps also introduce additional latency—*i.e.*, delays experienced during gameplay—relative to native apps because developers are unable to optimize the “decoder” that converts the data streamed from the cloud to a user’s device into video. (Patel Tr. 433:13-434:5.) When programming a native application, Nvidia has a high degree of control over the decoder and can “spend engineering resources in creating our own algorithm and looking for

packet losses . . . and optimizing the video stream”. (Patel Trial Tr. 434:6-11.) Web apps offer “nowhere near the level of control that a native applications has”. (Patel Trial Tr. 434:12-15.) Users experiencing high latency can be at a competitive disadvantage during gameplay. (Patel Trial Tr. 434:18-435:11.)

- iv. Given these deficiencies with web apps as compared to native apps, Nvidia would prefer to distribute its GeForce Now service as a native app on iOS than as a web app on iOS; in other words, the “native app would be a better experience for the user” and would provide Nvidia with “more control” over the end user’s experience. (Patel Trial Tr. 429:15-430:2, 438:13-14.) Instead, Nvidia currently only offers its GeForce Now cloud gaming service as a web app on iOS through the Safari web browser because Apple would not approve its native app on iOS. (Patel Trial Tr. 428:1-6; 429:18-21; 530:24-531:17; Athey Trial Tr. 1874:18-19, 1874:24-1875:5; PX-2109.1 (“NVIDIA GeForce NOW has been rejected by ERB”); PX-2280.1 (“We will reject the app now and let the developer know

that they can do this on [S]afari and submit individual games.”)

- c. Microsoft also wanted to distribute its game streaming service as a native app on iOS rather than as a web app because “[a] web browser is a much more challenged experience, both to build and to maintain than a native app, and it also lacks much of the functionality and benefits that you get through a native app.” (Wright Trial Tr. 577:9-14.) Microsoft now offers its cloud gaming service only through the iOS Safari web browser because Apple would not approve its native iOS app; a web app was Microsoft’s “only outcome to reach mobile users on iOS”. (Wright Trial Tr. 579:1-10.) Some of the limitations of web apps that hamper Microsoft’s streaming service include that developers must use Apple’s WebKit engine, which lacks “some of the features behind other browsers” like push notifications. (Wright Trial Tr. 577:9-578:15.)
- d. Apple itself initially intended to distribute three of the iPhone’s pre-installed apps—Weather, Stocksand Calculator—as web apps, but those performed poorly, an so Apple replaced them with native apps before they were launched. (Ex. Depo. 4 at 82:22-83:07, 83:21-25 (Forstall).)

241. Given these many limitations, web apps are not substitutes for native apps. (See *supra* Paragraphs ¶¶ Error! Reference source not found.-Error! Reference source not found.; 238-240.)

M. Streaming Services Are Not Substitutes for Downloading Games Locally as Native Apps.

242. “App streaming” occurs when an app resides on a remote server (often referred to as “the cloud”); a user accesses the server through an Internet connection and the user’s commands on its local device are conveyed through the Internet to the remote server and executed there. (Patel Trial Tr. 422:3-7; Grant Trial Tr. 712:22-24 (“A streaming app would be an application where the [content] that the user is experiencing is delivered over the internet from [a] server.”); Sweeney Trial Tr. 135:18-136:9.) The server that hosts the app then sends a live video or audio stream to the device on which the user then views the stream. (Patel Trial Tr. 422:3-7 (“GeForce Now has servers in the data center. These are similar to what you would have as PCs at home, but in the server class. And this is where the games are run, and then we stream a video stream to the user so that he can see and enjoy the game.”); Grant Trial Tr. 712:22-24.) Before streaming services were developed, users were limited to playing video games locally on their home consoles or PCs—*i.e.*, they would have to “buy a PC, buy the software, install it, and play.” (Patel Trial Tr. 422:16-20.)

243. Nvidia, Google, Amazon and Microsoft each offer streaming services. (Sweeney Trial Tr. 178:7-10; Patel Trial Tr. 442:11-12.)

- a. Nvidia’s service is called GeForce Now. (Patel Trial Tr. 422:13-15; *see supra* Paragraph L.240.b.)

- b. Google's service is called Stadia. (Patel Trial Tr. 442:11-12; Fischer Trial Tr. 901:19-21.)
- c. Microsoft's service is called xCloud, or Xbox Cloud Gaming. (Patel Trial Tr. 442:11-12; Wright Trial Tr. 565:23-566:1; Fischer Trial Tr. 902:13-15.)
- d. Amazon's service is called Luna. (Patel Trial Tr. 442:11-12.)

244. Users typically pay a separate fee to subscribe to these services. (Fischer Trial Tr. 902:8-11, 902:22- 903:1, 903:8-13; Grant Trial Tr. 713:25-714:4.) For some services, users must pay this fee in addition to purchasing individual games. (Patel Trial Tr. 425:4-8.) For example, for Nvidia's GeForce Now streaming service, although GeForce Now makes a set catalog of games available for streaming to users, the users must separately own the games independently of the GeForce Now service in order to stream them. (Patel Trial Tr. 425:4-8 ("We make those games available to users, but the users have to own them. They must have had to purchase their games through either Steam, or Epic Games Store or Microsoft, and the games that they have purchased are available for play.").) Users cannot purchase a game—or any other software—on GeForce Now. (Patel Trial Tr. 425:1-426:1.) Additionally, only a small subset of games are available via streaming services. (Patel Trial Tr. 424:3-25.)

245. When a user requests an app to perform a particular function, such as gameplay movements or playing or pausing a show or piece of music, the user input is transmitted from the displaying device—the mobile phone, for instance—back to the server. (Grant Trial Tr. 714:17-21 ("[W]hen the user performs an action on the device such as touching

the screen, that data will be sent back . . . through the internet to the machine in the cloud, and the machine will then execute the interaction as if the user had done it themselves.”); Patel Trial Tr. 423:11-16 (“In cloud gaming, the hardware lives in the data center. So every time a user presses a button, we send the button to the data center, feed it to the game running on the server there. The game generates what we call a video frame. We take that video game, and through engineering, compress it, send it to the user and show it to the user.”).)

246. This “round trip” for the video or audio feed and user input reacting to it can lead to time delays, or “latency”. (Grant Trial Tr. 715:10-15 (“Any application, whether it’s a high-performance graphic application or a low performance one, there will be time associated with taking that picture, compressing it, sending it to the user, decompressing it, and then having the user’s response sent back to the server.”); Patel Trial Tr. 433:16-17.) This inherent latency in streaming results in higher latency when streaming a game as compared to playing a game locally. (Patel Trial Tr. 442:24-443:3.)

- a. Latency can significantly impact the experience of the game. (*See* Grant Trial Tr. 716:1-5 (“[B]ecause multiplayer games have an element of competition, and both in terms of users wishing to perform well and users wishing to outsmart each other, latency is considered very problematic. High degrees of latency in multiplayers are considered just bad.”).)
- b. Latency in games that are streamed (as compared to games played locally) can result in delayed interaction, competitive

disadvantages and a poorer gaming experience. (Patel Trial Tr. 434:8-11, 434:20-23; Athey Trial Tr. 1786:12-20 (explaining that app streaming services are “nascent,” and that “games today . . . struggle with some latency challenges,” including “delays”)).

- c. For example, a user playing *Fortnite Battle Royale* through a web app could be at a competitive disadvantage to someone playing on a native application due to latency. (Patel Trial Tr. 435:21-24.)
Users have complained about this inherent competitive disadvantage. (Patel Trial Tr. 435:25-436:4.)

247. Even under ideal conditions, streaming services have severe limitations that make them poor substitutes to native apps.

- a. Streaming services require a fast Internet connection, which means that they cannot be played anywhere and everywhere. (Patel Trial Tr. 443:7-446:25.)
- b. As noted above, streaming services are vulnerable to latency issues to a greater extent than software running locally on a device because of the round trip that data must take from the device to the server and back again. (Patel Trial Tr. 442:24-443:6.)
- c. Scalability is limited. Streaming services are not able to host all of their users at one time due to limited server capacity; users who are not able to access the service may need to wait seconds, minutes or

more, or be denied access entirely. (Grant Trial Tr. 713:25-714:10 (“[S]treaming apps, because they are running on a machine in a data center . . . they’re occupying physical hardware and usually there has to be some sort of fee associated with that, so you may have to join a membership program to have access to streaming apps. The nature of that relationship and the fact that those machines have to be even higher power than a typical web server means that there’s often contention [for] access. So you may regularly find when you go to play a cloud gaming app, that you have to wait in a queue or pay a fee to be . . . a premium member of the service.”); Patel Trial Tr. 447:1-450:23.)

- d. [REDACTED], further limiting scalability.
(Grant Trial Tr. 713:25-714:10; [REDACTED])
- e. [REDACTED] also typically requires users to pay in the form of subscription fees. (Grant Trial Tr. 713:25-714:10;
[REDACTED])

248. Nvidia’s GeForce Now service illustrates a number of these limitations, confirming that cloud-based game streaming is not a substitute for playing a game that has been downloaded locally onto a user’s device.

- a. *First*, “there can be competitive disadvantages for a user with higher latency”. (Patel Trial Tr. 435:10-11.) And even aside from

the competitive disadvantages, “the user may feel uncomfortable with the latency, doing an action and seeing the action performed later, it could result in if they are in a racing game, turning too late, for example.” (Patel Trial Tr. 434:20-23.)

b.

Second, [REDACTED]

[REDACTED] In comparison, there are no capacity limitations or

waiting times when users want to play games locally on iOS.

(Patel Trial Tr. 450:6-8.)

c.

Third, Nvidia places game session limits of one hour for free users, who comprise the majority of GeForce Now users, and six hours for paying users. (Patel Trial Tr. 449:8-13.) Once users reach

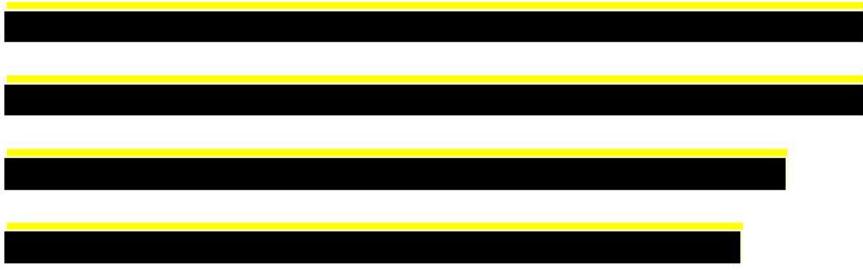
their game session limit, their game is terminated and they must return to the queue in order to play again. (Patel Trial Tr. 450:1-2.) There are no gaming session limitations when users want to play games locally on iOS. (Patel Trial Tr. 450:3-5.)

- d. *Fourth*, server outages can render streaming services unavailable during the period in which the outage occurs. (Patel Trial Tr. 450:9-16.) Server outages are not a risk to someone who plays a game locally on iOS. (Patel Trial Tr. 450:21-23.)
- e. *Fifth*, streaming services inherently require strong internet connection to operate well, which is not necessary to play a game capable of offline play locally on a device. (Patel Trial Tr. 443:7-24; PX-721.1 (GeForce Now “require[s] 15mbps, and recommend[s] 50mbps.”) Consequently, users generally cannot stream their games when they are on the go—*i.e.*, they cannot stream games on the subway, in the park, or on an airplane without experiencing inferior gaming quality and data overcharges, as well as the risk of not being able to stream at all if the connection is not strong enough. (Patel Trial Tr. 446:14-25.)

f. [REDACTED]

[REDACTED]

[REDACTED]



g. *Seventh*, the games selection on GeForce Now is limited to a small catalog, as compared to the large catalog of games available for local play on devices. (Patel Trial Tr. 424:8-9 (“Today [Nvidia] ha[s] about 800 games, which is a small subset of all the games in existence.”).) The games available on GeForce Now are also limited to games written for PC; GeForce Now cannot host games that do not run on that platform—*i.e.*, games written for Xbox, PlayStation, Nintendo or iOS. (Patel Trial Tr. 426:10-427:1.)

249. Reflecting similar challenges, Google’s Stadia service has been “very significantly scaled back” since its public launch. (Sweeney Trial Tr. 321:21-24.)

250. Streaming services are particularly poor substitutes for iOS apps. (Sweeney Trial Tr. 173:17-23; Wright Trial Tr. 577:11-14.) That is because Apple, under its general prohibition on a “store within a store”, does not allow on the App Store any apps that offer a selection of third-party streamed apps. (PX-56 § 3.2.2 (prohibiting apps from “[c]reating an interface for displaying third-party apps, extensions or plug-ins similar to the App Store or as a general interest collection”); Fischer Trial Tr. 900:14-15.)

251. In September 2020, Apple modified its App Store Review Guidelines to allow game streaming apps, but only if each streamed app is made available as a separate app on the App Store. (*See* PX-56 § 4.9.1. (“Each streaming game must be submitted to the App Store as an individual app so that it has an App Store product page, appears in charts and search, has user rating and review, can be managed with ScreenTime and other parental control apps, appears on the user’s device, etc.”).)

252. Each of Nvidia, Microsoft and Google sought to launch their game-streaming services as native iOS apps before Apple modified its Guidelines, but all three were rejected by Apple. (Patel Trial Tr. 438:24-439:15; Wright Trial Tr. 534:18-535:8.) None of these services chose to launch hundreds of separate iOS apps—one per streamed game—as required by the new Apple Guidelines. (Patel Trial Tr. 440:25-441:4; Wright Trial Tr. 650:15-651:6; *see also* PX-2048.1 (“Stadia by Google has been rejected by ERB”); PX-2109.1 (“NVIDIA GeForce NOW has been rejected by ERB”).) Craig Federighi, Apple’s Senior Vice President of Software Engineering, testified that there are currently no streaming apps on the App Store. (Federighi Trial Tr. 3490:4-6.)

- a. Microsoft, for example, has developed a cloud gaming service that operates like many other media and entertainment streaming services already available as native iOS apps, but Apple has prohibited Microsoft’s streaming app from being offered in the App Store. (Wright Trial Tr. 652:1-7.)

- i. Like Netflix, Microsoft's streaming service is accessible through a subscription that enables users to sign in and receive access to a library of content (in this case, games). (Wright Trial Tr. 651:14-652:5.) While Apple has created a “special carve out for all other types of media and entertainment”, which allows services like Netflix and Spotify to be available as native iOS apps through the App Store, Apple prevented Microsoft from offering an identical service for games as a native app on iOS. (Wright Trial Tr. 569:17-23; PX-2116 ([REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]).)

ii. Instead of allowing Microsoft to offer the same kind of catalog streaming service for games as Netflix offers for movies and television shows, Apple’s policies require Microsoft to “take every game and separate it out into an individual app”, which would have been like “asking Netflix to break out every single TV show or every single

movie and run them as a separate streaming app”. (Wright Trial Tr. 650:10-651:6.)

- iii. Microsoft chose not to do this because it would have been “untenable”, “would fundamentally break the service”, and was “not something [Microsoft] could reasonably do.” (Wright Trial Tr. 650:20-651:6; *see also* PX-2311.)
- iv. Moreover, Apple’s requirement that each streamed game in the subscription catalog be broken out as an individual app would have created a “bad experience” for customers, including because updates to the streaming technology would be implemented across all of the individual apps at once—so “all of your apps would just be constantly spinning” with updates—and because any time a game left the catalog “there would be a dead app sitting on the phone”. (Wright Trial Tr. 570:11-23; *see also* PX-2311.)

- b. Mr. Patel also testified that in order to comply with Apple’s guidelines concerning game streaming services, Nvidia would have had “to take [its] 850 games that [it] ha[s] a license for and create individual App Store applications and submit them for approval.” (Patel Trial Tr. 441:2-4.)

- i. In other words, Apple required that Nvidia submit separately each game available in the GeForce Now catalog to Apple for approval, that Nvidia list separately each game available in the catalog on the App Store, and that users download separately an app for each game they want to stream on their iOS device. Breaking apart its catalog in this manner was not possible for Nvidia, which does not own the rights to the third-party games in its GeForce Now streaming catalog. (Patel Trial Tr. 441:6.)
- ii. Moreover, Apple did not inform Nvidia of any security basis for requiring the catalog to be broken apart such that each individual game would be submitted to the App Store for review and approval. (Patel Trial Tr. 442:2-4.) Apple imposes this requirement despite the fact that no game-specific software is ever actually downloaded onto a user's device because it runs instead from the "cloud". (Patel Trial Tr. 423:20-23.)

253. GeForce Now and xCloud are now both available on iOS through the Safari web browser. (Patel Trial Tr. 430:10-12; Wright Trial Tr. 652:16-25.) This further degrades the service because of the inherent latency and limitations of web apps discussed above. (*See* Section III.L.) For both companies, releasing their streaming services through

Safari was a last resort, because “[it] was [Microsoft’s] only outcome in order to reach mobile users on iOS” (Wright Trial Tr. 579:1-10), and Nvidia “would have preferred a native application” (Patel Trial Tr. 530:24-531:1).

254. *Fortnite* is available through Nvidia’s GeForce Now game streaming service on PCs and Mac, but not on iOS. (Sweeney Trial Tr. 177:9-12; Patel Trial Tr. 476:20-22.)

255. Streaming services also cannot solve the switching and mixing matching costs discussed above. As Dr. Athey explained, “[streaming services] are not big enough . . . one of the big constraints has been bandwidth.” (Athey Trial Tr. 1787:14-18.)

256. Finally, Apple has shown an interest in stifling the growth of cloud streaming in order to protect its native iOS distribution monopoly. In August 2017, Apple was considering whether to purchase a cloud game streaming company, LiquidSky, and invest in that new line of business. (PX-464.) Apple identified LiquidSky as a company that could support “AAA games in the cloud”, which were “not available on iOS or MacOS” and that would “require more computer horsepower than the client system (*e.g.*, Pro apps on MacBook Air)”. (PX-464.) LiquidSky also touted its technology as able to support non-game streaming apps. (PX-464.) But Apple ultimately decided that “running AAA Windows game titles in the cloud is [not] consistent with Apple’s business model” given that Apple should protect its core business of providing products based on native computing power, *i.e.*, apps that must pass through Apple’s App Store. (PX-464.2.)

IV. APPLE HAS MONOPOLY POWER IN THE iOS APP DISTRIBUTION MARKET.

257. Professor Schmalensee, Apple’s lead economist, conceded that if the iOS App Distribution market defined by Dr. Evans is a valid antitrust market, Apple is a monopolist, and it has market power. (Schmalensee Trial Tr. 1895:19-1896:7.) Epic has submitted substantial evidence demonstrating that Professor Schmalensee is correct on this point.

A. Apple Uses Its Control over iOS to Monopolize App Distribution Through Contractual Restrictions.

258. Apple conditions developers’ access to the billion iOS users on contractual restrictions that cement Apple’s control over all iOS app distribution. (PX-2619 (DPLA); Schiller Trial Tr. 2759:22-2760:9, 2760:16-21, 2761:15-20 (agreeing the terms are “standardized for all developers” and non-negotiable); Sweeney Trial Tr. 152:8-9 (“My understanding is Epic was under a contract of adhesion, a nonnegotiable contract.”).)

259. Any developer who wants to distribute a native iOS app to consumers must do so through the App Store. (Sweeney Trial Tr. 133:22-23 (“The iOS App Store is the general way of distributing apps to consumers.”); Cook Trial Tr. 3931:25-3932:13 (agreeing that Apple “decide[s] for [consumers] that the only way they can get a native app is through [the] App Store”); Kosmynka Trial Tr. 986:9-12 (“The only way to get a consumer app on the iPhone is through the iOS App Store.”).)

260. To distribute an app through the App Store requires: (1) access to the software tools that allow developers to write code that will work on iOS; and (2) access to the App Store itself. (Schiller Trail Tr. 2760:22-2761:14; Grant Trial Tr. 669:2-8 (“A user who

wishes to develop an app will pick a platform. They will download the SDK for that platform, and then they will create the software using the tools that the SDK provides . . .”), 674:25-675:7 (“Xcode would be the primary method of a developer who wished to create an app for iOS.”); PX-2619 (DPLA) § 3.2(g).)

261. Apple controls both of these inputs through a series of non-negotiable terms by which developers must abide. (PX-2618 (Developer Agreement); PX-2619 (DPLA); PX-2622 (Xcode and Apple SDKs Agreement); Schiller Trial Tr. 2757:2-8, 2760:16-21; Ex. Depo. 16 at 284:7-13, 284:15 (Okamoto); Simon Trial Tr. 353:24-354:4; 357:3-13; Sweeney Trial Tr. 152:8-9.)

262. To obtain access to testing and distribution of apps on iOS, developers must set up a Developer Program account with Apple and accept the Apple Developer Agreement. (Grant Trial Tr. 719:6-18.)

- a. The Apple Developer Agreement establishes certain basic terms governing the developer’s relationship with Apple. (PX-2618 (Developer Agreement).)
- b. A second agreement, the Developer Program License Agreement (“DPLA”), governs the terms and conditions of distribution through the App Store, and is governed by the laws of the United States and the State of California. (PX-2619 (DPLA) § 14.10.)

- c. To distribute a free app, a developer must enter into Schedule 1 of the DPLA. (PX-2619.65 (Schedule 1); Joint Pretrial Conference Statement ¶ 15.)
- d. To distribute a paid app or offer any in-app purchases, a developer must enter into Schedule 2 of the DPLA. (PX-2943 (Schedule 2); Schmid Trial Tr. 3307:13-3308:2; Joint Pretrial Conference Statement ¶ 15.)
- e. Section 7.1 of Schedule 2 provides, among other things, that “[i]f at any time Apple determines or suspects that [the signatory developer] or any developers with which [the signatory developer is] affiliated have engaged in, or encouraged or participated with other developers to engage in, any suspicious, misleading, fraudulent, improper, unlawful or dishonest act or omission, Apple may withhold payments due to [the signatory developer] or such other developers.” (PX-2943.9 (Schedule 2); Schmid Trial Tr. 3301:4-12.)

263. The Apple Developer Agreement and DPLA are “click-through”, or “standardized” agreements; they are non-negotiable. (Ex. Depo. 16 at 284:7-13, 284:15 (Okamoto); Schiller Trial Tr. 2757:4-5, 2760:6-9; Sweeney Trial Tr. 152:8-9 (“My understanding is Epic was under a contract of adhesion, a nonnegotiable contract.”).)

264. Through a number of unlawful provisions, the DPLA requires developers to agree to make Apple's App Store the only channel for commercially distributing their apps on iOS. (PX-2619.)

- a. Section 3.2(g) of the DPLA provides that "Applications for iOS Products . . . may be distributed only if selected by Apple (in its sole discretion) for distribution via the App Store". (PX-2619 (DPLA) § 3.2(g).)
- b. Section 3.3.2 of the DPLA provides that apps may not download or run executable code that, among other things, "create[s] a store or storefront for other code or applications". (PX-2619 (DPLA) § 3.3.2.)
- c. Section 7.6 of the DPLA provides that developers must "agree not to distribute [their apps] for iOS Products . . . to third parties via other distribution methods" than those expressly permitted under the DPLA. (PX-2619 (DPLA) § 7.6.)

265. When developers sign the DPLA, they further agree to comply with the App Store Review Guidelines. (PX-2619 (DPLA) § 6.1; PX-2619.70 (Schedule 1) § 6.3; PX-2943 (Schedule 2) § 7.3; Simon Trial Tr. 361:14-16 (Q. Do you have to comply with these guidelines as your products are available in the App Store? A. Yes."); Wright Trial Tr. 602:6-8 ("Q. And you know that any app that seeks to be on the App Store must comply with the App Store guidelines; right, ma'am? A. Yes.").)

266. Apple published its first set of App Store Review Guidelines in 2010. (PX-56A; Schiller Trial Tr. 2833:25-2834:2 (“The first time [Apple] published them externally was in 2010.”).)

- a. Prior to 2010, Apple did not make any guidelines available to third-party developers to explain the criteria it used for app review. (PX-2316.1; Schiller Trial Tr. 2833:25-2834:2.)
- b. The 2010 version of the Guidelines made it clear that Apple anticipated making changes to the Guidelines from time to time. (PX-56A.1 (“This is a living document, and . . . may result in new rules at any time.”).)
- c. Apple periodically revises the App Store Review Guidelines. (PX-56; PX-56A; PX-2790; Fischer Trial Tr. 947:6-14 (“We do change the guidelines.”); Kosmynka Trial Tr. 984:14-16; Schiller Trial Tr. 2833:15-21 (“They are modified at least yearly, sometimes more than once in a year.”).)

267. The Guidelines contain a number of prohibitions that constrain competition and innovation.

- a. The Guidelines prevent developers from distributing would-be competing third-party app stores through the App Store. (PX-2790 (App Store Review Guidelines) §§ 3.2.1(ii), 3.2.2(i); Fischer Trial Tr. 900:14-16 (“Q. You would agree with me, sir, that app store

- review guidelines prohibit stores within stores? A. Yes.”); Kosmynka Trial Tr. 1003:2-6) (agreeing that Guideline 3.2.2 “prohibits stores within stores”.) Section 3.2.1(ii) provides that apps that display or recommend a collection of third-party apps “should provide robust editorial content so that it doesn’t seem like a mere storefront.” (PX-2790 (App Store Review Guidelines) § 3.2.1(ii).) Section 3.2.2(i) provides that apps may not “create[e] an interface for displaying third-party apps, extensions, or plug-ins similar to the App Store or as a general-interest collection”. (PX-2790.13 (App Store Review Guidelines) § 3.2.2(i).)
- b. The Guidelines prohibit developers from integrating any competing payment processing solution for processing in-app payments for digital content in their iOS apps and prohibit developers from “encouraging users to use a purchasing method other than in-app purchase” “either within the app or through communications sent to points of contact obtained from account registration within the app.” (PX-2790 (App Store Review Guidelines) §§ 3.1.1, 3.1.3.)
- c. The Guidelines prevent cloud gaming services from offering their games in a streaming catalog on iOS. (PX-2790 (App Store Review Guidelines) § 4.9.)

268. Apple also controls distribution of iOS apps through technological means.
- a. With respect to consumers, Apple prevents direct downloading of apps from developers' websites. (Kosmynka Trial Tr. 986:9-12 ("The only way to get a consumer app on the iPhone is through the iOS App Store."), 986:17-25.)
 - b. With respect to developers, Apple requires that all third-party apps be validated and signed using an Apple-issued certificate in order to be distributed through the App Store. (DX-5492.98; Grant Trial Tr. 716:13-717:7; Federighi Trial Tr. 3373:11-3374:2.)
 - c. "A certificate is a digital credential . . . that can be used to authenticate that a piece of data came from a source." (Grant Trial Tr. 716:13-16.) Developers use their certificate to sign their app, and Apple uses that signing information to verify that the identity of the signer is the same as the identity of the account-holder. (Grant Trial Tr. 716:17-717:1.)
 - d. If a developer is removed from the Apple Developer Program, then previously held certificates are no longer valid. (Ex. Depo. 13 at 40:12-25 (Haun).) Instead, when a user launches such an app, the operating system communicates "the state of the certificate" and give "the customer . . . opportunities to either run or not run the application." (Ex. Depo. 13 at 40:12-25 (Haun).)

- e. Apple offers a special type of certificate for businesses seeking to write and distribute in-house applications for use within their organization. (Mickens Trial Tr. 2586:10-2587:9; Federighi Trial Tr. 3411:21-3412:12; *see also* DX-5492.99.) Businesses apply to the Apple Developer Enterprise Program for an enterprise signing certificate. (Mickens Trial Tr. 2586:16-22 (“[T]he basic idea is that the enterprise first has to go to Apple and has to register with the Enterprise Program.”).) With the enterprise signing certificate, the business is able to sign apps distributed and managed by that enterprise for its employees. (Mickens Trial Tr. 2586:16-22 (“If Apple agrees to let the enterprise into the program, then the enterprise can then allow its own internal developers to create apps, to sign apps, and these apps are going to be signed by the enterprise developers, not by Apple.”); Federighi Trial Tr. 3434:9-25.) Apps that are part of Apple’s Enterprise Program can be distributed on iOS devices without going through the App Store. (Mickens Trial Tr. 2586:23-2587:2; Federighi Trial Tr. 3434:9-25.)
- f. Apple also makes available special types of certificates for the purpose of developing and testing iOS apps prior to wider distribution. (PX-2619.16 (DPLA) § 3.2(g).) Development or ad hoc certificates allow a developer to distribute an iOS app to a

limited number of pre-approved devices. (PX-2619.37 (DPLA) § 7.3.) If the developer wishes to beta test its app with a larger user base (up to 10,000 test devices), then it must use Apple's TestFlight service. (PX-2619.37 (DPLA) § 7.4; Simon Trial Tr. 407:5-8; Fischer Trial Tr. 948:22-949:10; Kosmynka Trial Tr. 986:17-22.)

B. Apple Has 100% Market Share in the Market for iOS App Distribution.

269. Apple has a nearly 100% share in the market for iOS app distribution. (Kosmynka Trial Tr. 986:9-12 ("The only way to get a consumer app on the iPhone is through the iOS App Store."); Schiller Trial Tr. 2738:12-14 (Q. "[S]o from the outset, is it accurate that the App Store was to be the only means to distribute apps on the iPhone?" A. Yes, it was.)); Ex. Expert 1 (Evans) ¶ 146.)

- a. As both parties agree, Apple's app distribution restrictions apply to all apps. (Evans Trial Tr. 1453:12-18, 2448:5-2449:21; Ex. Expert 16 (Evans) ¶ 39; Schmalensee Trial Tr. 1941:21-1942:3.)
- b. The App Store supplies distribution services to developers. (Evans Trial Tr. 1454:11-16, 1707:2-17; Schmalensee Trial Tr. 1955:3-23; Schiller Trial Tr. 2748:1-13.)
- c. The App Store supplies these services to developers of all types of apps, regardless of what services those apps offer to consumers

and whether those apps compete with each other. (Evans Trial Tr. 1457:10-1458:25.)

270. Apple has the power to set the price and control output in the market for iOS app distribution. (*See* Sweeney Trial Tr. 322:19-323:2; Simon Trial Tr. 364:22-365:2; Evans Trial Tr. 1563:18-1537:3.)

271. Apple does not license iOS to any other mobile device maker. (Schiller Trial Tr. 2723:18-19.)

272. The App Store is preloaded onto the home screen of all iOS devices. (Fischer Trial Tr. 857:10-15; Federighi Trial Tr. 3461:11-14.)

273. The only apps that come preinstalled on iPhones are Apple apps. (Fischer Trial Tr. 872:24-873:2.)

274. With the exception of Developer Enterprise Program apps (*see* Section XI.I below) or jailbroken iOS devices, the App Store is the exclusive means by which iOS users download native iOS apps. (Kosmynka Trial Tr. 986:9-12 (“The only way to get a consumer app on the iPhone is through the iOS App Store.”), 986:17-25 (agreeing that “other than the enterprise program and things like Test Flight or testing, in order for a consumer to obtain a native app on their phone, they need to have an app that has gone through the app review process by the iOS App Store”); Schiller Trial Tr. 2729:19-24 (jailbreaking is “a way to sideload software onto [an] iPhone”).)

275. Non-commercial and other distribution channels for iOS apps are not reasonable substitutes for distribution through the App Store.

- a. Apple allows limited distribution outside the App Store for testing purposes (Test Flight) and for internal distribution within a firm or institution (the Enterprise Program), but these distribution channels cannot be used to reach the broad iOS user base. (Sweeney Trial Tr. 133:20-134:1 (“The iOS App Store is the general way of distributing apps to consumers. However, Apple makes a number of other mechanism available for limited purpose distribution. For example, to enterprise employees or to testers working on a software development environment.”), 134:10-12 (“[The test environment] is not available for general distribution [] to consumers. If a particular consumer were participating in a small scale test, you might be able to access it that way.”); Fischer Trial Tr. 948:22-949:10; Kosmynka Trial Tr. 986:17-22; PX-72.40-41)
- b. Apple phones are sometimes “jailbroken” by users, meaning that users remove the protections within iOS against installation of third party apps through channels other than the App Store. (Ex. Depo. 20 at 509:13-25 (Shoemaker); PX-871.1; Schiller Trial Tr. 2729:19-24.) Apple objects to jailbreaking of phones and makes efforts to prevent it; jailbreaking also voids the warranty on the device. (Ex. Depo. 16 at 278:7-12 (Okamoto); Schiller Trial Tr. 2729:25-2730:17, 2733:15-22.)

C. The App Store's Profit Margins Are Extraordinarily High.

276. One indication of market power in the relevant market is the sustained existence of higher profit margins than would exist in a competitive market. (Ex. Expert 16 (Evans) ¶¶ 40-43; Cragg Trial Tr. 2287:23-24 (recognizing "high and sustained margins" as evidence of market power).) As Professor Schmalensee has maintained for 40 years, including at trial, "persistently high economic profit is suggestive of market power". (Schmalensee Trial Tr. 1984:2-1984:12.)

- a. High profit margins "provide evidence of market power because . . . in a competitive environment . . . over time the margins would have declined in the face of competition, either as a result of prices falling or as a result of substantial investments . . . that would improve . . . quality". (Evans Trial Tr. 1545:3-14; *see also* Cragg Trial Tr. 2287:22-2288:2.)
- b. In a competitive market, companies would vie for consumer dollars through price competition. (Evans Trial Tr. 1545:3-14; Ex. Expert 1 (Evans) ¶¶ 146-48.)
- c. In a market with robust price competition, prices trend downwards, to a level closer to a firm's costs. (Evans Trial Tr. 1545:3-14; Ex. Expert 1 (Evans) ¶¶ 146-48.)

- d. High profit margins also suggest a company's ability to charge a price far in excess of costs. (Evans Trial Tr. 1545:3-14; Ex. Expert 1 (Evans) ¶¶ 146-48.)
- e. This can indicate lack of competition in a market. (Evans Trial Tr. 1545:3-14; Ex. Expert 1 (Evans) ¶¶ 146-48; *see also* Cragg Trial Tr. 2287:22-2288:2.)

277. Presentations given to Apple executives with decision-making authority over the App Store include detailed financials specifically relating to the App Store. (PX-602; PX-608; PX-610; Ex. Expert 2 (Barnes) ¶¶ 4-9; Barnes Trial Tr. 2459:23-2460:1 ("I was able to identify documents that set forth . . . profit and loss statements . . . specifically for the Apple App Store."); Ex. Depo. 19 at 56:6-8 (Rollins) ("My understanding [is] that . . . those presentations were provided to Apple's executives.")) Those presentations detail, among other things, the

[REDACTED] in fiscal years 2018 and 2019, respectively. (PX-602.154; PX-608.78.) These net revenues translate into operating margins of [REDACTED] for fiscal year 2018 and [REDACTED] for fiscal year 2019 after taking into account specific App Store expenses and categories of joint costs that are allocated to the App Store. (PX-602.154; PX-608.78.) A similar margin was predicted for fiscal year 2020—[REDACTED].

(PX-602.154; PX-608.78; Ex. Expert 2 (Barnes) ¶¶ 5, 8.) [REDACTED]
[REDACTED]
[REDACTED]

[REDACTED] (PX-602.149; *see* Cook Trial Tr. 3902:2-7 ("Q. Do you have

an understanding, sir, of the order of magnitude of the iOS App Store versus the Mac App Store revenues? A. The iOS would be larger. Q. How much larger, sir? A. A lot larger.”).)

278. Apple’s App Store profit margin for 2019 was vastly higher [REDACTED] times higher) than the profit margins of other online marketplaces where profits are measured on a comparable basis. (Ex. Expert 1 (Evans) ¶ 151; Evans Trial Tr. 1548:4-10 (“Apple’s profit margin was vastly higher than this benchmark group of companies, including even the most successful one of these companies.”) To conduct this comparison, Dr. Evans relied on the research of Ned Barnes, Epic’s forensic accounting expert, who identified and reported operating profit percentages for other online marketplaces with accounting sufficiently similar to the accounting utilized by Apple for the App Store. (Ex. Expert 2 (Barnes) ¶¶ 22-27; Barnes Trial Tr. 2465:16-2466:2 (describing assignment to “report operating profit and operating profit percentages for other online marketplaces to the extent . . . their accounting was sufficiently similar to the accounting for the App Store”).) As part of his assignment, Mr. Barnes expressly limited his investigation “to only those marketplaces that recognized revenue on a net basis”, because that is how Apple “has determined that it is appropriate to recognize revenue for the App Store”. (Barnes Trial Tr. 2466:24-2467:5 (“Apple has determined that it is appropriate to recognize revenue for the App Store on a revenue recognition at net. And I agree with that. I fully agree that they have applied the criteria properly and reached that conclusion. But when I went to go investigate other online marketplaces, I wanted to limit my investigation to only those marketplaces that recognized revenue on a net basis.”); *see also* Barnes Trial Tr. 2466:9-17 (“[I]f you think about the App Store, for example, when a hypothetical app is sold for \$10 and \$7 is

remitted to the developer, Apple would keep the \$3 commission. Apple recognizes just the \$3 of commission as revenue. That is what we call revenue recognition on a net basis. If you think about the alternative, if Apple were to sell an app for \$10 and recognize revenue of \$10, and then report a cost of sale for the \$7 that it has distributed to the developer, that is revenue recognition on a gross basis.”).)

279. According to benchmarking performed by Apple itself, comparing the App Store’s projected fiscal year 2020 operating margin percentage against the operating margin percentages for Apple’s other service business lines—as well as external companies including Netflix, Disney, Nintendo and Activision—the App Store’s operating margin greatly exceeds the highest operating margin of any benchmarked company, with that margin [REDACTED] being over [REDACTED] higher than the closest benchmark. (PX-2392.3; Cook Trial Tr. 3882:3-8 (describing PX-2392 as “a benchmarking exercise from looking at reported operating margins from companies that . . . would report for their full company”.) Mr. Cook testified that the margins for external companies were not directly comparable to the margins for a business like the App Store because “if one were comparing a company that reports on [an] agency or net basis and one that reports in . . . the by-sale or regular basis”, “[y]ou would have to go back and account for things in the same manner in order to make the numbers comparable”. (Cook Trial Tr. 3884:7-14.) But as Mr. Barnes explained, for the comparison of the App Store’s profitability to that of other online marketplaces relied upon by Dr. Evans, he accounted for the issue described by Mr. Cook by limiting the investigation to only those other online marketplaces that recognized revenue on a net basis. (Barnes Trial Tr. 2466:3-2467:5.)

280. Mr. Barnes was also retained to research and calculate the App Store's operating margin and operating margin percentage, and he conducted further analysis to account for additional expenses associated with the App Store that were identified by Mark Rollins, a corporate witness for Apple who "indicated that there were certain operating expenses or certain expenses in general that had not been reflected in those profit and loss statements". (Barnes Trial Tr. 2460:2-11; Ex. Expert 2 (Barnes) ¶¶ 10-13; PX-756.2 (Apple letter designating Mr. Rollins to provide testimony on, among other things, "any formal assessments of the revenue, costs, expenses, and/or investment related to the Apple App Store").) After taking the additional costs identified by Mr. Rollins into account, Mr. Barnes reported margins for the App Store of 79.6% for fiscal year 2018 and 79.6% for fiscal year 2019. (Ex. Expert 2 (Barnes) ¶¶ 2, 13; Barnes Trial Tr. 2459:5-10 (noting that his calculations of the App Store's operating margin percentages "were approximately 79 percent in both 2018 and 2019").) Although Apple's cross-examination of Mr. Barnes implied that there could be *other* categories of expenses not included in these calculations, Apple never sought to supplement the sworn testimony of its witness designated pursuant to Federal Rule of Civil Procedure 30(b)(6) to identify such additional categories of expenses. And, in any event, such criticisms are irrelevant because, as discussed below, documents later produced by Apple contain Apple's own calculations of its operating margins, which are very similar to Mr. Barnes's estimates. (PX-2385; PX-2393; Ex. Expert 2 (Barnes) ¶ 2; Barnes Trial Tr. 2460:12-2462:16.)

281. On the last day of fact discovery, Apple produced documents from Mr. Cook's files that were prepared by Apple's Corporate Financial, Planning & Analysis

(“FP&A”) team, which reports directly to Apple’s CFO and Mr. Cook. (Barnes Trial Tr. 2460:12-25, 2495:5-11; PX-2385; PX-2391; PX-2392; Cook Trial Tr. 3895:22-3896:19.) One such document, a “Products & Services Profitability” presentation dated September 2019, reports the following profit margin percentages for the App Store as a standalone profit center: [REDACTED]

[REDACTED] 74.9% for fiscal year 2018, 77.8% for fiscal year 2019, and [REDACTED] (PX-2385.18; Ex. Expert 2 (Barnes) ¶ 2; Barnes Trial Tr. 2462:13-16 (“These documents show that Apple calculated its own operating margin percentage for the App Store to be 77.8 percent for fiscal year 2019 and 74.9 percent for fiscal year 2018.”).) Mr. Barnes testified that based on his experience as a forensic accountant, the documents that included these profitability calculations were created in the course of business and with business purposes in mind. (Barnes Trial Tr. 2465:5-15.) [REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]

282. In cross-examining Mr. Barnes, Apple sought to establish that he had “seen no testimony explaining why these documents were created” or “used”, and he did not know “how often these types of documents were created”. (Barnes Trial Tr. 2483:19-2484:3, 2486:1-19.) However, the reason there had been no testimony was because the documents “were produced to Epic on the last day of discovery in this case”, after depositions were completed. (Barnes Trial Tr. 2495:5-11.) When Mr. Cook was shown the September 2019 “Products &

Services Profitability” presentation during his direct examination at trial, he testified that he had reviewed the document with Apple’s CFO and “some of the CFO staff” and described the document as a “one-off presentation that looked at profitability trends . . . over time”. (Cook Trial Tr. 3877:23-3878:1, 3880:20-24.) When asked whether similar documents were “routinely prepared at Apple”, Mr. Cook replied that the September 2019 “Products & Services Profitability” presentation “was the only one” that he recalled. (Cook Trial Tr. 3878:14-16; *see also* Cook Trial Tr. 3906:21-25 (“Q. [T]his wasn’t a one-off presentation, though, was it sir? A. I don’t remember having this type of presentation before. Q. How about since? A. I don’t know.”).) On cross examination, however, Mr. Cook was shown and testified that the Corporate FP&A team had created another presentation dated December 18, 2019 that contained a set of slides on “Profitability”, [REDACTED]
[REDACTED]
[REDACTED]. (Cook Trial Tr. 3908:25-3910:21; PX-2391.104-111; *see also* PX-2391.107 ([REDACTED]) On redirect, Mr. Cook explained that the December 2019 presentation was a “more regular” “quarterly P&L update for the company” and explained that while he didn’t recall the “exact meeting” at which the presentation was made, “generally, this would have [had] a broader audience to it than [the September 2019 “Products & Services Profitability” presentation]”. (Cook Trial Tr. 3965:13-3966:4.)

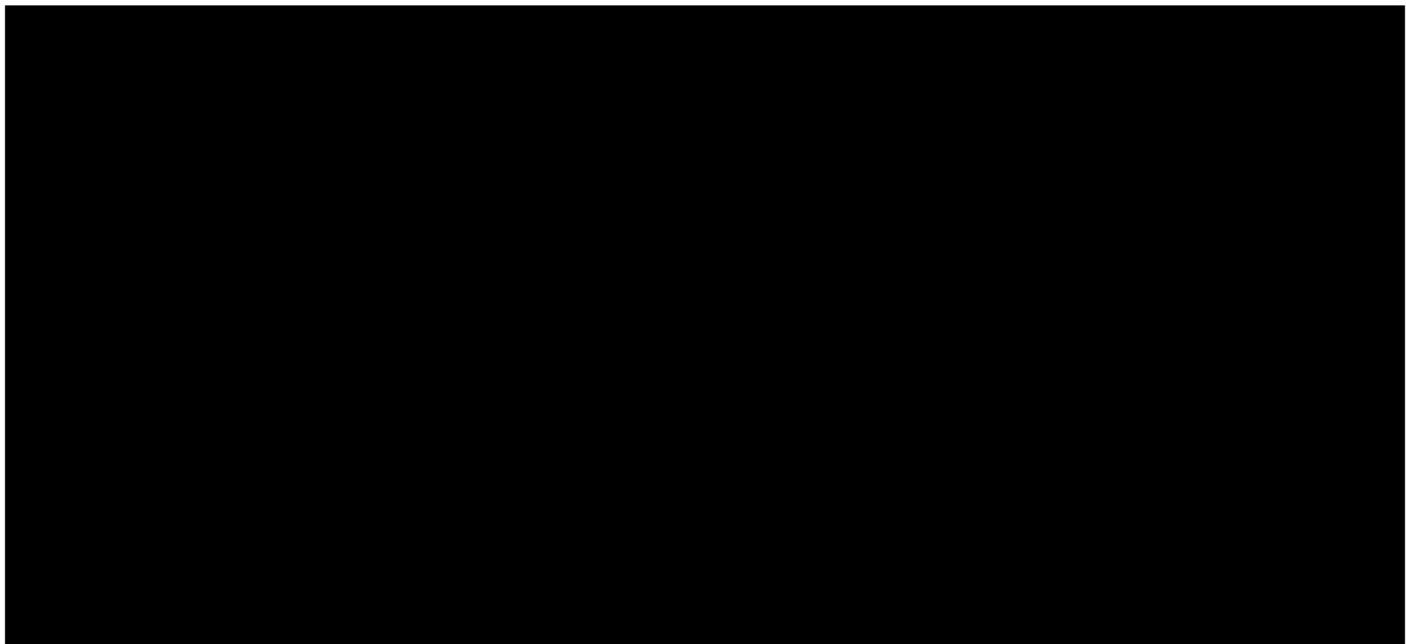
283. Using these documents from Mr. Cook’s files, Mr. Barnes was able to confirm that the profitability calculations therein reflected “fully burdened” profit margins; that

is, that all of the expenses incurred by Apple as a company had been systematically assigned or allocated to each of its individual profit centers, including the App Store. (Barnes Trial Tr. 2463:14-2464:9.) He did so by “look[ing] at the individual revenues and expenses for all of the individual business units within Apple”, “total[ing] them up and agree[ing] to what Apple reported publicly for its company-wide revenues and expenses”, an exercise that gave Mr. Barnes confidence that “all of the revenue and all of the expenses had been properly attributed to or allocated to individual business units, including the App Store”. (Barnes Trial Tr. 2464:2-9; Ex. Expert 2 (Barnes) ¶ 18; PX-1001.)

284. When asked whether he was “concerned at all that Mr. Ned Barnes . . . said he could compare some numbers” in certain of the documents from Mr. Cook’s files “to publicly reported documents” (Cook Trial Tr. 3967:9-15), Mr. Cook testified that he could not see how it would be possible to do so because Apple’s “publicly reported numbers are more of gross margin at the services level, not operating margin per service type”. (Cook Trial Tr. 3967:9-15.) While Mr. Cook is correct that Apple’s SEC filings do not break down operating expenses across Apple’s various services business lines, his testimony about a comparison not being possible was proven incorrect by Mr. Barnes’s analysis of the Corporate FP&A documents. (Ex. Expert 2 (Barnes) ¶ 18; PX-1001.) Specifically, using fiscal year 2018 as an example, Mr. Barnes first relied on numbers reported in the September 2019 “Products & Services Profitability” presentation (PX-2385.18-19) to sum the individual revenue, costs of goods sold (“COGS”), operating expenses (“Opex”), and operating margin (“OM”) for each of Apple’s existing services profit centers (App Store [REDACTED])

[REDACTED] Licensing [REDACTED] Apple Care [REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED] to get total

numbers for all services [REDACTED] The
graphic below shows how Mr. Barnes took these numbers directly from the September 2019
presentation:



(PX-2385.18-19; PX-1001; Ex. Expert 2 (Barnes) ¶ 18.) After adjusting for minor rounding errors, those totals agreed with the “Total Services” profitability numbers reported on another slide from the same presentation. (PX-2385.13 PX-1001; Ex. Expert 2 (Barnes) ¶ 18.)

Mr. Barnes then combined the “Total Services” numbers for fiscal year 2018 [REDACTED]

[REDACTED] with the fiscal year 2018 totals for Apple’s [REDACTED]

[REDACTED]

[REDACTED]

(PX-2385.15; Ex. Expert 2 (Barnes) ¶ 18; PX-1001.) The sum of these numbers [REDACTED]

[REDACTED] tied out to the total net sales, total cost of sales, total operating expenses, and total operating income for the entire company reported by Apple in its public Form 10-K:

Apple Inc.			
CONSOLIDATED STATEMENTS OF OPERATIONS			
	(In millions, except number of shares which are reflected in thousands and per share amounts)		
	Years ended	September 28, 2019	September 29, 2018
	September 29, 2018	September 30, 2017	
Net sales:			
Products	\$ 212,683	\$ 225,847	\$ 196,534
Services	46,291	39,748	32,700
Total net sales	<u>260,174</u>	<u>265,595</u>	<u>229,234</u>
Cost of sales:			
Products	144,996	148,164	126,337
Services	16,786	15,092	14,711
Total cost of sales	<u>161,782</u>	<u>163,756</u>	<u>141,048</u>
Gross margin	98,392	101,830	88,186
Operating expenses:			
Research and development	16,217	14,236	11,581
Selling, general and administrative	18,245	16,705	15,261
Total operating expenses	<u>34,462</u>	<u>30,941</u>	<u>26,842</u>
Operating income	63,930	70,890	41,344
Other income/(expense), net	1,807	2,005	2,745
Income before provision for income taxes	65,737	72,900	44,089
Provision for income taxes	10,481	13,372	15,738
Net income	<u>\$ 55,256</u>	<u>\$ 59,528</u>	<u>\$ 48,351</u>
Earnings per share:			
Basic	\$ 11.07	\$ 12.01	\$ 9.27
Diluted	\$ 11.09	\$ 11.91	\$ 9.21
Shares used in computing earnings per share:			
Basic	4,617,834	4,955,377	5,217,342
Diluted	4,648,913	5,000,109	5,251,692

See accompanying Notes to Consolidated Financial Statements.
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PX-2668.36 (Apple FY2018 10-K)

(PX-2668.36 (red boxes added); Ex. Expert 2 (Barnes) ¶ 18; PX-1001.) This confirms that, in preparing these documents, Apple's Corporate FP&A team has fully allocated every dollar of cost reported by the company as a whole to individual business units, including the App Store. From a financial accounting perspective, this is the definition of a fully allocated or fully burdened P&L statement. (Ex. Expert 2 (Barnes) ¶ 18.)

285. Epic's economic expert, Dr. Cragg, reached consistent conclusions about the App Store's profitability; he "measured high and sustained margins by the App Store" and concluded that there is an "absence of competitive pressure from other app stores". (Cragg Trial Tr. 2287:22-2288:2.)

286. Despite the multiple claims by Apple that "Apple does not calculate P&Ls by products and services because they view it as an unproductive exercise" (Ex. Expert 8 (Schmalensee) ¶ 115; Schiller Trial Tr. 3021:25-3022:16 (testifying that he did not know

whether the App Store was profitable); Cook Trial Tr. 3876:18-20 (“Q: Has Apple ever attempted to determine the specific profitability of the App Store as a stand-alone business unit? A: No.”), 3892:8-10 (agreeing that he testified that “Apple does not maintain a separate P&L for the App Store”); PX-1677.47 (Kyle Andeer, Apple’s VP and Corporate Law & Chief Compliance Officer: “[W]e don’t have a separate profit and loss statement for the App Store.”)), Apple has routinely generated profitability calculations for the App Store: (1) estimates for 2016-2020 from Apple’s Corporate Finance, Planning & Analysis team produced from Mr. Cook’s files (PX-2385.18); (2) App Store P&Ls in Apple’s internal App Store presentations to executives at least annually from 2018-2020 (PX-602.154; PX-608.78); and (3) an App Store P&L covering 2013-2015 sent to Eddy Cue and “requested [by Luca Maestri, Apple CFO] for [his] organization”. (PX-609.1; PX-610.) Moreover, although Apple repeatedly claimed that it does not allocate costs to specific products and services (*see, e.g.*, Malackowski Trial Tr. 3662:2-8; Cook Trial Tr. 3892:11-14, 3899:9-13), Mr. Cook admitted at trial that Apple has at least two systematic ways of allocating operating expenses to particular business lines, and that it is capable of updating those calculations as it did when the September 2019 profitability numbers were revised for the December 2019 “quarterly P&L update”. (Cook Trial Tr. 3900:2-5 (“Q. So your corporate financial planning and analysis group does have, I guess, at least two methods, maybe more, for allocating operating expenses; correct? A. I assume so.”), 3909:11-23; PX-2385.13-15, .24-25 (noting that allocations are being done “[b]ased on Method 2 for Allocation Opex”); PX-2391.105-107 (same).)

287. Professor Schmalensee opined that “operating margin is not a measure of profitability”, relying on an example of “[t]wo factories producing the same product selling at the same price in a competitive market”, one that has only one worker but has “invested a lot in machinery”, while the other “really hasn’t made much . . . by way of investment and has a lot of workers”. (Schmalensee Trial Tr. 1899:22-1900:3.) According to Professor Schmalensee, “the mechanized factory is going to have lower operating costs so it’s going to show a higher operating margin”. (Schmalensee Trial Tr. 1900:4-9.) Professor Schmalensee’s example does not support his opinion. As Mr. Barnes—a certified public accountant with 25 years of practice as a forensic accountant (Barnes Trial Tr. 2456:6-18)—testified, operating margin (or profit) is “basically the income that is generated by a business or a business unit from its core business activities” and is calculated by “the revenue less the expenses that are required to generate that revenue”. (Barnes Trial Tr. 2457:13-16.) Mr. Barnes explained that Professor Schmalensee’s factory example omits the “very real operating expense of depreciation that would be deducted for the amortization of the equipment that had been purchased by the one factor[y] in his example”. (Barnes Trial Tr. 2458:8-21.) Accordingly, the mechanized factory would *not* necessarily have lower operating costs and thus a higher operating margin than the other factory. (Barnes Trial Tr. 2458:8-11.)

288. While Professor Schmalensee testified that “having a high accounting rate of return on investment doesn’t establish the existence of high economic profits” (Schmalensee Trial Tr. 1899:19-21), he conceded that “there is no particular bias in which direction the difference between” economic profitability and accounting profitability goes (Schmalensee Trial

Tr. 1980:13-17; Schmalensee Trial Tr. 1980:17 (“It depends on a lot of things.”).) As Dr. Evans testified, economists have the tools to figure out whether accounting profits are an appropriate measure of monopoly power given the particular business at issue, and after reviewing “profit and loss statements, together with the testimony and other information regarding those profits and information regarding those profits and information regarding the existence of costs that need to be allocated”, he was able to conclude that Apple’s profits in the App Store are relevant and indicative of Apple’s market power. (Evans Trial Tr. 1723:20-1724:19.)

289. Professor Schmalensee included an exhibit in his written testimony that was “intended to offer information about the operating margins of certain publicly-traded companies that have online stores” and to “point[] out that Apple’s operating margin is not out of line with other operating margins of companies large and small that are . . . among other things, in the online store business”.⁷ (Schmalensee Trial Tr. 1984:23-1985:5, 1986:24-1987:2; Ex. Expert 8 (Schmalensee) Exhibit 2.) However, the operating margins in that exhibit were all calculated on a company-wide basis and Professor Schmalensee conceded at trial that the comparison “doesn’t say anything about whether Apple does or does not have market power in any individual line of business”. (Schmalensee Trial Tr. 1986:21-24.)

290. According to Professor Schmalensee, “R&D that affects all aspects of Apple’s business can’t be allocated to individual lines of business or parts of a business in a way

⁷ Professor Schmalensee testified that he “took the list of companies from Mr. Barnes’ list of people who operated stores” to generate Exhibit 2 in his written direct testimony. (Schmalensee Trial Tr. 1985:3-5.) However, none of the online marketplaces identified by Mr. Barnes (Ex. Expert 2 (Barnes) ¶ 22, Table 4) appear in Professor Schmalensee’s Exhibit 2.

that isn't just arbitrary". (Schmalensee Trial Tr. 1902:2-4.) But Professor Schmalensee testified that he was aware of a document "put together for Mr. Cook and found in his files" that "contains actual allocations of R&D expenditures to the App Store" and shows that "very little of Apple's R&D was actually allocated to the App Store". (Schmalensee Trial Tr. 1981:16-1982:5; PX-2385.24.) Mr. Barnes explained how that document "was indicative that Apple was employing a rigorous analytic method to determine how costs should either be identified to specific business units or allocated if they were shared across multiple business units". (Barnes Trial Tr. 2498:3-7.) For example, he demonstrated how a slide titled "FY'20 Opex Product Allocation" shows how Apple attributes operating expense categories to its various products and services lines. (Barnes Trial Tr. 2499:2-2500:20; Ex. Expert 2 (Barnes) ¶¶ 19-22; PX-2385.24.)

[REDACTED]
[REDACTED].⁸ (Ex. Expert 2 (Barnes) ¶¶ 19-22.)

⁸ Mr. Barnes was able to confirm that the App Store is accounted for in the "Rest of Services" category in this document by comparing the total operating expenses for the "Services" category shown on another slide in the same presentation (PX-2385.12). (Barnes Trial Tr. 2499:2-2500:20, 2501:20-2502:4.) [REDACTED]

[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]

Mr. Cook similarly testified based on his review of that slide that “the R&D and SG&A allocation to services is very, very small”. (Cook Trial Tr. 3880:10-11.)

291. In sum, the exceptional and persistently high profit margins of the App Store are a strong indication of Apple’s market power. They demonstrate that the App Store’s success cannot be attributed solely to competition on the merits; instead, Apple has been able to extract supra-competitive rents from developers and consumers due to a lack of competition for iOS app distribution. (Evans Trial Tr. 1545:3-14; Cragg Trial Tr. 2287:22-2288:2.)

- a. Apple’s claim that its 30% commission is not supra-competitive because other platforms charge similar rates ignores the reality of other stores’ rates. Many app stores advertise a headline rate of 30%, but in reality, their average rate actually charged to developers is significantly lower. (Evans Trial Tr. 2439:6-2441:23; Sweeney Trial Tr. 310:1-17; Schmalensee Trial Tr. 1958:1-3.)
- b. For example, the [REDACTED] negotiates its commission rate with developers. Epic pays [REDACTED] as opposed to the headline rate of 30%. (Sweeney Trial Tr. 203:15-22; Evans Trial Tr. 2439:10-22; DX-3472.)
- c. Console makers regularly engage in negotiations with developers, as well, and secure terms that factor into the overall value that the app developer receives. (Sweeney Trial Tr. 310:1-17;

Schmalensee Trial Tr. 1958:1-3 (“It’s my understanding that the consoles are more prone than, say, the App Store to negotiate special deals with individual suppliers.”); [REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]

- d. The Amazon App Store has an average effective commission rate of [REDACTED], and [REDACTED]
[REDACTED]. (Evans Trial Tr. 2439:23-2440:14.)
- e. Steam lowered its commission rates to a “tier basis” with the average effective rate of [REDACTED]
[REDACTED] (Evans Trial Tr. 2440:20-2441:6.)
- f. Steam’s commission rate does not account for the fact that developers on PC can directly distribute to consumers; this allows them to use their own payment solution, which on average costs developers about 5% of revenues. (Evans Trial Tr. 2441:7-13; Ko Trial Tr. 806:22-807:6 (Epic pays an average of 4.2% for payment solutions worldwide and 3.5% in the United States).)

- g. The commissions charged by game consoles are not comparable because of their “radically different” business model.
(Schmalensee Trial Tr. 1972:23-1973:4, 1971:25-1972:22
(testifying with respect to hardware that “that’s not where they [console manufacturers] make their money” and “that has been the general view for a long time”); Evans Trial Tr. 2441:16-23 (“I just don’t view . . . the console game stores to be good comparisons . . . because of the different business model. And the reason the commission is being charged in that particular business, it’s just different.”).)
- h. It is also important to contextualize Apple’s 30% commission, which was initially inspired by the “wholesale-to-resale model” where physical stores had to account for costs that aren’t present with a digital store, such as theft and markdowns. (Allison Trial Tr. 1196:2-18; *see also* Allison Trial Tr. 1203:10-1204:6 (noting that Valve, the company that owns and operates Steam, was a first mover in the digital PC game distribution market and adopted its 30% commission based on the physical retail markup).)

292. The absence of competition on the merits, including price competition, is also evident in how Apple originally set the price for distribution of apps, and how it has maintained it. (Ex. Expert 1 (Evans) ¶ 158.)

- a. When the App Store launched in 2008, Apple established the commission rate that developers would have to pay for sales of apps through the App Store. (Ex. Depo. 3 at 135:8-136:2 (Cue).)
- b. The process for setting that price was an ad hoc one: Mr. Cue and Mr. Jobs simply decided the rate. (Ex. Depo. 3 at 135:8-136:14 (Cue).)
- c. The commission rate was chosen without consideration of App Store costs. (Ex. Depo. 3 at 136:3-14, 137:23-138:14 (Cue); Schiller Trial Tr. 3105:12-3106:5.)
- d. The commission rate was set without regard to costs of providing developers with software development tools. (Ex. Depo. 3 at 137:23-138:14 (Cue); Schiller Trial Tr. 3105:12-3106:5.)

293. In June 2011, the individual in charge of marketing the iPhone, Mr. Schiller, stated that he did not think “that 70/30 will last . . . forever” because “someday we will see enough challenge from another platform or web based solutions to want to adjust our model”. (PX-417.1; Ex. Depo. 3 at 143:25-144:6, 145:6-13 (Cue).)

- a. The potential for App Store profits of over \$1 billion annually caused Mr. Schiller in 2011 to pose the question: “is that enough to then think about a model where we ratchet down from 70/30 to 75/25 or even 80/20” if that would permit Apple to maintain a

“\$1B a year run rate”. (PX-417.1; Ex. Depo. 3 at 143:25-144:6, 145:6-13 (Cue).)

- b. Mr. Schiller’s email raised the idea that in the face of competition, Apple would need to lower the commission rate. (Evans Trial Tr. 1555:13-1556:5.) Further, Dr. Evans calculated that in this hypothetical world where the App Store maintained this level of profits, [REDACTED]
[REDACTED] (Evans Trial Tr. 1556:6-17; Ex. Expert 1 (Evans) ¶ 182.)
- c. Not only was the App Store successful in 2011, but it has also “been successful each and every year since”. (Schiller Trial Tr. 3021:1-8.)
- d. Since 2011, App Store profits have grown by more than an order of magnitude, to well over [REDACTED] per year. (*See* Sections II.F and IV.C.)

294. Apple still does not consider costs in setting its commission to this day. (Ex. Depo. 3 at 137:23-138:14 (Cue); Ex. Depo 8 at 140:10-15, 140:17-21, 140:24-141:3, 141:5-7 (Cue); Schiller Trial Tr. 3105:13-3106:5.)

- a. The App Store Director of Business Management, Carson Oliver, testified that while he has been “involved in discussions about changes to the commission structure for IAP on the App Store”, he

does not recall “any discussion about the costs associated with running the App Store, the costs associated with processing IAP” or “any cost component”, nor can he recall being “asked to do any kind of financial analysis pertaining to costs on the App Store as it relates to changes to the commission structure”. (Ex. Depo. 17 at 272:8-17, 280:5-23 (Oliver).)

295. After this lawsuit was filed, Apple lowered its commission structure for “small business owners”. (Schiller Trial Tr. 2810:16-2811:5.)

- a. In late 2020, Apple announced the App Store Small Business Program, which entitles qualifying developers—those earning no more than \$1 million in total proceeds across all of their apps (sales net of Apple’s commission and certain taxes and adjustments) during the 12 fiscal months occurring in the prior calendar year—to “a reduced commission of 15%”. (PX-2943 (Schedule 2) § 3.4(b); Schiller Trial Tr. 2810:16-2811:5.)
- b. Developers whose proceeds exceed \$1 million will be charged the “standard commission” for the remainder of the calendar year, but may re-qualify for the program in subsequent calendar years if they fall below the \$1 million threshold. (PX-2943 (Schedule 2) § 3.4(b).)

- c. Apple recognizes that reducing its commission rate would spur innovation. When Apple announced the program, it stated that the “new developer program [would] accelerate innovation and help small businesses and independent developers propel their businesses forward”. (DX-4096.)
- d. Evidence introduced at trial made clear that Apple’s announcement of the Small Business Program was not the result of competition. According to Mr. Cook, “[i]t was the result of . . . feeling like we should do [something] from a COVID point of view”. (Cook Trial Tr. 3992:4-3993:1.) But internal emails reveal that Apple’s true motivation behind the Small Business Program was more cynical than COVID relief. Shortly before trial, Apple clawed back some of these emails under the guise of privilege. Mr. Schiller even submitted a declaration, swearing that one such email was privileged. But Magistrate Judge Hixson held that “Apple and Schiller . . . mischaracterized the email thread”, and ordered Apple to re-produce it. (ECF No. 512.)
- e. In this email thread, Mr. Schiller explained [REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

- f. With the cat out of the bag by trial, Apple's witnesses conceded that litigation and regulatory pressure forced their hand. (Schiller Trial Tr. 2813:5-10 ("And [this lawsuit] – I would absolutely agree that it – it helped to get a program done that we wanted done.")); Cook Trial Tr. 3992:13-14 ("[O]f course we had those things – the lawsuits and all the rest of the stuff in the back of my head.").)
- g. Apple had also instituted this program, in part, in response to "hearing feedback worldwide" regarding various competition law issues faced by Apple. (Schiller Trial Tr. 3017:21-24, 3018:6-12; *see also* Schiller Trial Tr. 3070:21-23 ("[T]here has been scrutiny and criticism of the App Store that mattered from around the world.")); PX-1896; PX-1897; PX-1901.) This worldwide "feedback" includes, but is not limited to, government investigations by Russia (PX-1899; PX-1907), the European Commission (PX-1906), Australia (PX-1909; PX-1913), Korea (PX-1914), the House Judiciary Committee (PX-1908, PX-1915),

the Senate Judiciary Committee (PX-1910) and actions by developers such as Spotify (PX-1917.)

i. In response to complaints about the App Store, Apple also undertook PR efforts, such as “compil[ing] a list of developers that [it felt were] likely to provide public statements of support for Apple”. (PX-1922.1; Schiller Trial Tr. 3040:17-22.)

h. [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED] (See PX-2303.4 ([REDACTED]

[REDACTED]; PX-2389.9-13 [REDACTED]

[REDACTED]; Schiller Trial Tr. 3062:23-3063:13,

3064:19-22.) [REDACTED]

[REDACTED] (See PX-2303.4;

PX-2389.13.)

i. Apple also changed the commission rate for renewal subscriptions from 30% to 15% for the second year. (Schiller Trial. Tr. 3106:10-13.)

j. Despite these decreases, Apple's average effective commission rate has remained near constant over time, and was 27.7% in 2019. (PX-1050.)

296. Despite these nominal decreases in the commission rate, the real story of Apple's commission rate has been one of increases. Apple has raised its prices significantly at least three times:

- a. *First*, in 2009, Apple imposed the requirement that all in-app purchases of digital content be handled through Apple's IAP payment solution and that such purchases be subject to a 30% commission. (DX-4192.3-4) For those developers that had been offering in-app purchases prior to that date, this was an increase in price. (PX-1813.3; PX-1815.2; PX-1709.1; PX-1703.1-2; Ex. Depo. 4 at 252:06-13 (Forstall); Schmalensee Trial Tr. 1975:4-7).
- b. *Second*, in 2011, Apple decided to impose a new requirement that developers that sold in-app subscriptions would have to use IAP and pay a 30% commission. (DX-3060; *see* Section II.F above (discussing price increase for subscriptions).) This was an increase in the price of subscriptions. (PX-2162; PX-108.1; Schmalensee Trial Tr. 1975:11-21.)
- c. *Third*, in 2016, Apple introduced paid search ads to the App Store. This resulted in a de facto increase in price because developers

needed to buy search ads in order for their apps to be discoverable in the App Store. (Schiller Trial Tr. 2816:1-6; Cook Trial Tr. 3890:8-20.)

297. Apple's 30% commission is not akin to the commission charged by video game consoles, which Professor Schmalensee testified "have a radically different business model" than Apple does for the iPhone and iOS. (Schmalensee Trial Tr. 1972:23-1973:4.)

- a. As Professor Schmalensee testified at trial, iOS, like Windows, macOS and Android, is a "general-purpose operating system", or "foundational platform that provide[s] a platform for app developers and users to make all kinds of software". (Schmalensee Trial Tr. 1969:5-14; *see also* Ex. Expert 1 (Evans) ¶ 16; Evans Trial Tr. 1475:16-1476:1 (game consoles are examples of "special purpose operating systems" and "which follow a very, very different business model").) The iPhone, for example, "gets profit both from the apps, both from developers, and from hardware". (Schmalensee Trial Tr. 1972:21-22.)
- b. Video game consoles, on the other hand, are not foundational platforms in the sense that they are "designed and marketed primarily for games" and are thus "more special or niche operating systems". (Schmalensee Trial Tr. 1969:24-1970:11, 1970:16-1971:2.) While Apple "get[s] the bulk of [its] revenue from the

sale of hardware” for its general-purpose operating systems, iOS and macOS, “the universal view as to how the video game consoles make their money and run their business” is that they “make their money from the developers” and “sell their hardware at a loss” (Schmalensee Trial Tr. 1904:23-1095:1, 1971:25-1972:22; Wright Trial Tr. 551:24-552:10; DX-5523.31; *see also* Sweeney Trial Tr. 143:24-10 (“The general bargain in the console industry has long been the idea that console hardware is often sold at or below its manufacturing cost in order to bring in the larger user base.”). They employ this “developer pays” model to ensure that a sufficient number of consumers will purchase the console and be reachable by developers, who in turn will make large investments to write games for each platform. (Wright Trial Tr. 551:24-10, 623:15-19; Evans Trial Tr. 1476:4-8; Ex. Expert 1 (Evans) ¶ 16; Ex. Expert 13 (Cragg) ¶¶ 81-82.)

- c. Console makers do this because game development for consoles is often a lengthy and expensive process—far more expensive than development for mobile platforms—and the console makers need to try to assure developers that there will be a large enough user base for it to be worth the developers’ investment in developing a game for use on the console, which often takes years to complete.

(Ex. Expert 13 (Cragg) ¶¶ 81-82; Cragg Trial Tr. 2255:20-2258:14.)

- d. The console makers' commission rates, paid by developers through royalties on the sale of games and in-game content, are then the primary source of profit that they receive across the entire ecosystem. (Ex. Expert 1 (Evans) ¶ 16; Wright Trial Tr. 553:1-4, 623:20-24.) As a result, console makers engage in a host of negotiations with app developers regarding various terms and conditions, resulting in negotiated contractual arrangements in which a variety of terms factor into the overall value that the app developer receives. (Sweeney Trial Tr. 310:1-17; Schmalensee Trial Tr. 1958:1-3 ("It's my understanding that the consoles are more prone than, say, the App Store to negotiate special deals with individual suppliers . . .").)

- e. With respect to Microsoft, for example, the Xbox console business relies on a subsidization model, through which Microsoft does not earn a profit on the sale of its hardware but recoups its investment through the sale of software and services. (Wright Trial Tr. 552:3-10.) Because "[t]he hardware is critical to [Microsoft] delivering that gaming experience", "[t]here is a consideration that we have to fund the console in order to produce the experience that we do for

gamers and part of that commission goes to make it possible for us to build a console”. (Wright Trial Tr. 552:6-7, 623:15-19; PX-2477.)

f. Because it loses money getting the consoles into the hands of gamers, Microsoft must “make money over the long run on the game sales or the game subscriptions”. (Wright Trial Tr. 552:3-10.) In other words, the 30% standard commission fee that Microsoft charges on the Xbox Store is “required in order for [Microsoft] to be able to even build the console.” (Wright Trial Tr. 623:20-24.) Without the standard 30% commission on the Xbox Store, the Xbox business would be unprofitable. (Wright Trial Tr. 553:1-4.)

g.



see also DX-5523.66.)

298. Apple's 30% commission is also not akin to the commission charged by app stores on PC and Mac platforms. Three of the largest app stores on those platforms—EGS, Steam and Microsoft—have all lowered their prices in response to competition in the last 18 months. (Allison Trial Tr. 1249:19-25, 1283:7-24, 1284:22-1285:6; *see also* [REDACTED]
[REDACTED]
[REDACTED]
[REDACTED])

[REDACTED] By comparison, Apple felt no competitive pressure to change its prices when EGS entered and Steam lowered its prices. (Cook Trial Tr. 3993:2-6.) Further, as noted above, direct distribution is commonly used on PCs by developers and consumers, and this distribution channel greatly reduces the average price of distribution on PCs.

299. Apple's claim that this case could lead to the destruction of the "walled garden" business model is unfounded. Although console makers do operate exclusive app stores, the reality is that those app stores are in very different markets from the App Store with very different competitive conditions. With respect to the consoles, there is intense competition in the foremarket, as evidenced by the console makers selling hardware at or below cost. (Evans Trial Tr. 2379:18-2380:8.) The other significant difference is the relationship between the foremarket and the aftermarket. Unlike iOS, consumers are much better able to estimate the lifecycle costs of consoles; consumers buy consoles expecting to buy games and the price of games is not insignificant compared to the price of the hardware. (*See* Evans Trial Tr. 2380:9-2381:2.)

300. As noted above, Apple, by contrast, extracts [REDACTED] from the sale of iPhones, and developers do not participate in those profits, even though the availability of apps contributes greatly to the sale of devices. (See Sections II.F, IV.C below.) iOS developers thus take home 70% of App Store revenue, but that is only a fraction of the revenue generated by iOS; developers thus walk away with far less than 70% of the ecosystems' revenue. By comparison, also as explained above, because the console makers sell their hardware at a loss, the primary source of revenue for those ecosystems is game sales, so developers are taking home 70% of the ecosystems' revenues.

301. Game console manufacturers also provide greater marketing support than Apple does in the App Store. (Apple Ex. Depo. 2 at 131:2-17 (Kreiner).)

- a. Epic “receive[s] more support from [its] console partners than [it did] from [its] mobile partners”. (Weissinger Trial Tr. 1331:14-15.)
- b. Epic “work[s] very closely” with the console partners to plan ahead for the content it expects to release. Epic has “biweekly and monthly meetings with Microsoft and Sony” at which it “review[s] from a business level [the companies’] forward-looking content roadmaps”. These roadmaps sometimes planned out the partnership on a daily basis. (Weissinger Trial Tr. 1337:4-15.)
- c. In particular, the consoles provide “physical”, “real-life support”. (Weissinger Trial Tr. 1331:16-19.)

- i. This includes hardware bundles that pair “*Fortnite* content . . . with a PlayStation or with an Xbox” to be sold in brick and mortar stores. (Weissinger Trial Tr. 1332:4-9.)
- d. Epic works with its console partners to create retail SKUs, which are *Fortnite* codes packaged in boxes that look like “traditional video game[s]”. (Weissinger Trial Tr. 1332:10-13.)
- e. Microsoft has hosted a “Friday *Fortnite* series where every Friday, [Microsoft] would host play sessions where people could come in [to Microsoft’s retail stores within malls] and play *Fortnite* and win and earn prizes”. Similarly, Sony has done in-person events, too; it once set up a truck outside of the L.A. Coliseum during a gaming exposition where players could play *Fortnite* within the truck. (Weissinger Trial Tr. 1332:16-1333:8.)
- f. The console partners also provide digital support. (Weissinger Trial Tr. 1332:19-20.)
 - i. The consoles use their “huge social channels” to promote *Fortnite*. (Weissinger Trial Tr. 1333:9-14.)
 - ii. The console partners feature *Fortnite* on their digital stores. These features are particularly helpful because the consoles offer *Fortnite* users the ability to make *Fortnite* purchases directly on the store without having to open the *Fortnite*

game. This featuring is presented to users who are in a “purchasing mindset”. (Weissinger Trial Tr. 1334:3-12.)

- g. Nintendo hosted the *Fortnite* Switch Cup in Japan, which at the time led to the highest number of daily active users in Japan. (Weissinger Trial Tr. 1335:19-24.)
- h. Microsoft and Sony both allowed Epic to use their marquee intellectual property—Master Chief from the Halo franchise for Microsoft and Kratos from the God of War franchise for Sony—within *Fortnite*. Microsoft and Sony both agreed to make their coveted IP “purchasable” and “playable on the other platforms as well.” (Weissinger Trial Tr. 1336:2-15.)
- i. Apple’s support, by comparison, appeared “opportunistic”. Epic felt that its relationship with Apple was “transactional” and “impersonal”. The promotions Apple offered Epic would sometimes come with “strings attached”, and they would often be proposed at the last minute, which “cause[d] undue burden and stress” at Epic. (Weissinger Trial Tr. 1338:6-16.) Further, Apple’s social media support and featuring was not meaningful. Indeed, Apple would ask *Epic* to re-tweet the App Store Twitter account, leaving the impression at Epic that Apple wanted Epic’s support to “gain traction” on social media. (Weissinger Trial Tr. 1340:13-

24.) And unlike the console partners, Apple never ran a hardware bundle with Epic and never hosted *Fortnite* events. (Weissinger Trial Tr. 1345:18-24.)

D. Apple Does Not Track Relative Pricing of Apps on Non-iOS Platforms.

302. The pricing of apps on non-iOS platforms, including on Android, websites, or consoles, does not affect or constrain the commission Apple charges in connection with the distribution of iOS apps or in-app purchases.

- a. One of Apple's top executives who has been involved in the App Store since its launch, Eddy Cue, is not aware of "any studies as to the relative pricing of apps on the App Store vis-à-vis the Google Play Store". (Ex. Depo. 3 at 247:15-20 (Cue).)
- b. Similarly, Mr. Fischer is not aware of any reports or studies that track the relative pricing of apps or in-app purchases on Android compared to iOS. (Fischer Trial Tr. 904:18-905:6.)
- c. Match Group has tried to offer its Tinder dating service on the web in addition to as a native app, but the web version of Tinder has not been successful—despite Match Group promoting the web version and offering it at a lower price than the iOS mobile app version. (Ex. Depo. 1 at 23:9-17, 24:17-25:5, 25:14-26:5, 28:9-29:2 (Ong).) Match Group has not seen meaningful switching from

Tinder on mobile to Tinder on the web. (Ex. Depo. 1 at 28:9-22; 28:24-29:2 (Ong).)

- d. Down Dog offers subscriptions on its website at a cheaper price than the same subscriptions offered through its iOS mobile app, but approximately half of iOS users continue to purchase their subscriptions at the higher price through the app because Apple prevents Down Dog from informing them in the iOS app of cheaper options available elsewhere. (Simon Trial Tr. 359:3-17.) By contrast, on Android, where Down Dog informs its users that a cheaper subscription price is available on the web and provides a link to that subscription option, only about 10% of users choose the in-app purchase option on Android. (Simon Trial Tr. 360:7-13.) As a result, the average price that a user will pay for a subscription on Down Dog's Android app is 15% less than the average price that a user will pay for a subscription on Down Dog's iOS app because Apple's policies prohibit Down Dog from telling its users about the cheaper website option within the iOS app, even though Down Dog charges the same price on iOS and Android. (Simon Trial Tr. 364:4-13.)

303. Apple isolates its App Store from competition from other platforms by prohibiting app developers from informing iOS users, in the iOS app or on the App Store, of the

availability of their app on other platforms. (*See* PX-56 § 2.3.10. (“[D]on’t include names, icons, or imagery of other mobile platforms in your app or metadata, unless there is a specific, approved interactive functionality.”); *id.* § 3.1.1 (“Apps and their metadata may not include buttons, external links, or other calls to action that direct customers to purchasing mechanisms other than in-app purchase.”); *see also* DX-3796.4 (“The entire app experience must be setup for purchasing with IAP, and nothing the developer does in the app or outside the app is designed to encourage purchases for use on iOS happening anywhere but on iOS.”); Ex. Depo. 2 at 117:1-22 (Shoemaker) (describing Apple’s policy wherein “apps [were] generally prohibited from pointing to their availability on other platforms”); Ex. Depo. 1 at 158:4-159:14 (Ong) (describing restrictions on Match Group’s ability to inform its iOS customers of the option to purchase content outside of iOS app).)

- a. Apple has rejected Down Dog’s app for providing a link to its website, on which users can purchase the same subscription for cheaper. Down Dog continues to list a purchase link on its iOS app when it has web sales because the customer service issues and complaints are too severe otherwise given that Down Dog is not able to issue refunds to resolve those issues and complaints relating to purchases made in the iOS app. (Simon Trial Tr. 359:18-360:6, 415:11-23.)

V. APPLE'S CONDUCT CAUSES ANTI-COMPETITIVE EFFECTS IN THE iOS APP DISTRIBUTION MARKET.

A. Apple's Conduct Foreclosed All Manners of Distribution of Apps on iOS by Third Parties.

304. In order to determine whether Apple's conduct has caused anti-competitive effects in the iOS App Distribution Market, one must consider "the difference between the but-for world and the actual world". (Evans Trial Tr. 1721:12-18.) It is not possible to measure the anticompetitive effects of conduct by solely looking at the growth that has occurred in a market without comparing to the alternative where any restrictions are not present. (Evans Trial Tr. 1721:7-11.)

305. Where OS developers did not limit third party distribution on their OS, they saw entry by multiple online stores, which operated alongside direct distribution. (*See, e.g.*, Allison Trial Tr. 1200:14-1201:14 (describing digital games stores operated by Valve, Microsoft, Electronic Arts, Activision Blizzard, and Ubisoft, among others); Ex. Expert 1 (Evans) ¶ 107.)

a. In Windows, where Microsoft has not imposed limitations on app distribution by third parties, multiple third-party app stores offer distribution of apps, alongside direct distribution by multiple developers. (Ex. Expert 1 (Evans) ¶¶ 106-07; Wright Trial Tr. 553:25-554:6; Allison Trial Tr. 1200:14-1201:14.)

i. Like iOS, Windows is a general purpose platform. (Wright Trial Tr. 555:16-18, 557:10-15.) But unlike iOS, Windows is an open platform, allowing third-party app stores and

direct distribution by developers, while iOS is a closed platform. (Wright Trial Tr. 658:1-7, 553:25-554:6.)

- ii. The availability of alternative distribution methods in open platforms like Windows has significant impacts on how profits are allocated between platform-holders and developers. (DX-5523.) “Platform-holders in closed device ecosystems & networks capture meaningful profit share (39%-46%), while open ecosystems favor publishers . . .” (DX-5523.11.) On PC specifically, platform-holders retain only 5% of the share of profit, with 95% of the profit going to publishers. (DX-5523.11.) And on PC, direct-to-consumer distribution captured more than 83% of consumer spend, whereas PC platforms (such as the Microsoft Store) generated only 15% of sales. (DX-5523.17.)

- iii. While Microsoft does not allow direct app distribution by third parties and generally does not allow third-party app stores on its Xbox platform (with the exception of EA Play), those restrictions on Xbox are necessary to support the subsidization model described above. (Wright Trial Tr. 551:24-552:13, 552:19-553:4, 619:15-620:2, 620:14-25.)

Ms. Wright testified that those restrictions would not be fair if Microsoft imposed them on its Windows business—which, like iOS, is a large general purpose platform—given “how those devices are used and how many people they reach”. (Wright Trial Tr. 657:15-25.)

- b. In macOS, where Apple itself has not imposed limitations on app distribution by third parties, multiple third-party app stores offer distribution of apps, alongside direct distribution by multiple developers. (Ex. Expert 1 (Evans) ¶ 106; Sweeney Trial Tr. 95:23-96:1 (“However, Apple also operates the Mac App Store. And the Epic Games Store is, to some extent, in competition with the Mac App Store in that we both sell products to the same game users.”), 134:21-22; Federighi Trial Tr. 3470:2-4.)
 - c. Several app stores served older mobile operating systems, including Symbian, Blackberry and Windows Mobile. (Ex. Expert 1 (Evans) ¶ 165.)
 - d. Dozens of app stores, alongside direct distribution, are used by developers of Android apps in China, where there is no limitation on distribution of Android apps. (Ex. Expert 1 (Evans) ¶ 108; PX-1084.1.)
306. Apple recognizes that given the option, many developers would prefer to distribute their apps outside the App Store, either through other stores or directly.

- a. Many developers of Mac apps choose to distribute their apps outside the Mac App Store, including major developers such as Microsoft and Adobe. (Federighi Trial Tr. 3477:1-12 (explaining that Adobe Photoshop is not available on the Mac App Store but is available from Adobe's website and that Microsoft Office is available from both the Mac App Store and from Microsoft directly); PX-133.1 (containing what Apple employees described as "a rather comprehensive list of items" Adobe provided in response to Apple "ask[ing] them about their limited participation in the Mac App Store").) For this reason and others, Mr. Cook admitted that the revenues of the iOS App Store are "a lot larger" than the revenues from the Mac App Store. (Cook Trial Tr. 3902:2-7.)
- b. Apple executives have recognized that the Mac App Store matters only for distribution of Apple's own software and the apps of developers that cannot create their own download store, because big developers have many other choices. (PX-2386.1.)
- c. Notably, not a single developer testified on Apple's behalf to suggest that Apple's iOS business model is good for developers.

307. Epic asked Apple to allow Epic to open EGS on iOS and distribute iOS apps but Apple refused. (Sweeney Trial Tr. 151:9-23 ("My purpose in writing the letter was two things: First of all, to ask permission for Epic to release a store and use our own payment service

on iOS. And second, to express the hope that Apple would make these feature available to all developers.”).)

308. Nvidia and Microsoft both asked Apple to allow them to offer catalogs of cloud-streamed games through a native iOS app, but Apple refused. (Patel Trial Tr. 429:11-21, 438:15-439:7; Wright Trial Tr. 568:13-571:8, 579:1-10.)

309. Big Fish, a gaming app, asked Apple to allow it to distribute games within its app under a subscription model, but Apple refused. (PX-113.1-2; PX-114.1; Ex. Depo. 2 at 180:22-182:01, 182:23-183:09, 184:7-185:22 (Shoemaker).)

a. At the time Apple rejected Big Fish’s game subscription app, Apple did not have any guidelines prohibiting apps from offering other apps for distribution, leading Apple’s then-head of app review to declare the rejection “chicken shit. We don’t have a guideline for this.” (PX-114.1; Ex. Depo. 2 at 184:7-185:22 (Shoemaker).)

310. Professor Schmalensee conceded that “direct distribution does compete with online marketplaces” such as app stores, and this “doesn’t happen on the iOS platform because Apple forbids it”. (Schmalensee Trial Tr. 1917:1-8.) Accordingly, but for Apple’s conduct, therefore, competing app stores would have entered the iOS App Distribution Market, alongside the option of direct distribution of apps, offering a competitive alternative to the App Store. (Ex. Expert 1 (Evans) ¶¶ 160-168; Evans Trial Tr. 1510:24-1511:7 (“I concluded that in the absence of the restrictions, there would be multiple alternative App Stores, as we see in other environments where there are no restrictions or no meaningful restrictions on app distribution,

and that developers would use direct distribution to get apps into the hands of consumers”), 1537:8-17 (“[The aftermarket] includes third-party app stores, which would include the App Store, and it includes direct distribution.”).)

- a. Match Group, for example, would explore distributing its apps outside of the App Store if it had the option to do so. (Ex. Depo. 1 at 33:8-16, 33:18-34:7 (Ong).)
- b. Down Dog would distribute directly from its website on iOS if possible. (Simon Trial Tr. 392:6-18 (“Certainly if users could visit our website and install directly from our website, we would support that.”).)

B. Apple’s Conduct Increases the Price of Apps to Consumers.

311. Competition resulting from the elimination of artificial barriers generally results in increased productive efficiency and consumer welfare. (Evans Trial Tr. 1551:15-1552:2 (“We know from economics, both theory but also practical experience, in situations where there are barriers to competition and they’re removed that what typically happens and what you would expect to happen is that once competition is possible and those barriers are removed, that prices tend to fall [and] quality tends to improve.”).)

312. To examine the effect on competition in the iOS distribution market, Dr. Evans modeled entry of two new stores, each capturing 25% of the market (with Apple retaining a 50% market share). Under these assumptions of limited entry, and assuming the two entrants, rather than competing vigorously over price, would earn a profit margin of over 45%, Dr. Evans found that market-wide app store commissions would decline to a commission rate of

15.6%; the average price of apps (assuming a 50% pass-through rate) would decline by 6.5%; and output would expand by 16%. (Ex. Expert 1 (Evans) ¶¶ 183-84.) Dr. Evans further found that under his model, both the new entrants and Apple would be incentivized to spend significantly more than Apple does today on improving the quality of app distribution. (Ex. Expert 1 (Evans) ¶ 190.)

313. Epic's EGS charges a 12% commission for app distribution, as well as a 12% commission for in-app purchases when the app developer chooses to use Epic direct payment for in-app purchases. (Sweeney Trial Tr. 126:1-7.) Developers of apps distributed through EGS can also choose to use a competing payment solution for in-app purchases. (Allison Trial Tr. 1221:8-1223:10.)

- a. Absent Apple's restrictions, Epic would enter iOS and offer developers an alternative distribution platform at the same 12% commission rate. (Sweeney Trial Tr. 97:5-98:4 ("[O]ur Epic Games Store business is harmed by Apple's policies because we are barred from introducing a version of our store for iOS."); *see also* Allison Trial Tr. 1233:11-21.) Developers may decide to pass on some of those savings to consumers. (*See* Simon Trial Tr. 354:8-16, 355:14-356:7, 356:8-20 (explaining that Down Dog normally sets the web price of a subscriptions to its app 33% cheaper than the price of a subscription purchased on iOS due to Apple's commission, and it passes on Apple's commission fee to customers).)

- b. In addition, if EGS gains traction on iOS, Apple may be forced to lower the price it charges for distribution through the App Store. For example, shortly before EGS entered the PC and Mac space, Steam, an incumbent app store on these OSs, lowered its commission for the largest developers from 30% to 20%. (Allison Trial Tr. 1209:13-1210:1.)
- c. When Epic reached an agreement with Samsung to distribute *Fortnite* on Samsung devices, Epic and Samsung agreed to an [REDACTED] revenue share on in-app purchases. (DX-3472.7 § 8.2.)
- d. Competition from EGS, among other app stores, has also directly caused lower prices in the Windows ecosystem. For example, Microsoft recently announced that it will be reducing its commission from 30% to 12% in the Windows Store because “[t]here are multiple stores that compete on Windows. . . . [T]here is the Epic Games Store, there is the Steam Store, there is the ability to download the games directly from the publishers themselves, which happen to be the vast majority. . . . [I]n order for [the Windows Store] to be competitive and relevant, [Microsoft] needed to reduce the commission.” (Wright Trial Tr. 553:17-554:6; Allison Trial Tr. 1275:20-1276:5 (“Microsoft has switched to an 88/12 share on the Windows 10 Store.”).)

e. In the open PC and Mac platforms, 30% is no longer the standard commission for app distribution. (*See* Allison Trial Tr. 1249:3-6, 1249:22-25, 1283:7-24, 1284:22-1285:10.)

314. Developers pass on the cost of Apple's commission to consumers. (Ex. Expert 1 (Evans) ¶ 275; Simon Trial Tr. 356:8-17, 356:18-20 ("I would say that our customers" "ultimately bear[] the cost of Apple's 30 percent commission".).) Specifically, some developers currently charge consumers more on iOS than they charge through other distribution channels unencumbered by Apple's 30% commission, "to help offset the delta" of iOS's 30% fee. (PX-533.10 (Apple employees discussing how CBS priced its All Access subscriptions higher on iOS (where it faced a 30% commission) than on Apple TV (where it faced a 15% commission)); Ex. Depo. 12 at 174:21-23, 175:7-10, 176:23-177:5, 177:10-13, 177:15-17, 177:19-178:2, 178:10-21, 179:5-9 (Gray); Fischer Trial Tr. 911:4-15.)

a. Match Group, for example, takes into account Apple's commission when it sets prices within its iOS apps. (Ex. Depo. 1 at 74:8-10, 74:12 (Ong).) As a result, its customers face higher prices within its iOS apps. (Ex. Depo. 1 at 34:19-35:10, 84:1-3, 84:5-6, 84:22-85:3, 85:5-7 (Ong).) For example, a subscription to Tinder purchased through a web browser is 10-20% cheaper than a subscription purchased through the app. (Ex. Depo. 1 at 182:20-183:25 (Ong).)

b. Down Dog also takes into consideration Apple's commission when it sets prices within its iOS apps. (Simon Trial Tr. 356:8-17.) For example,

Down Dog prices its subscription purchased through a web browser at 33 percent cheaper than a subscription purchased through the iOS app. (Simon Trial Tr. 355:17-356:7.) This means that a subscription purchased through the iOS app is 50 percent higher than the same subscription purchased through a web browser. (Simon Trial Tr. 356:10-17.) Ultimately, Down Dog's customers bear the cost of Apple's 30 percent commission on Down Dog's iOS subscription payments. (Simon Trial Tr. 356:18-20.)

- c. This price differential exists even between iOS and other Apple platforms. For example, CBS All Access charges \$6.99 on iOS, where Apple's fee is 30%, but only \$5.99 on Apple TV, where Apple's fee is 15%. (PX-533.10; Ex. Depo. 12 at 176:23-177:5, 177:10-13; 177:15-17, 177:19-178:2, 178:10-21, 179:5-9 (Gray).)

C. Apple's Conduct Harms Innovation.

315. Apple's conduct harms innovation in both app distribution and app development. (Sweeney Trial Tr. 97:10 ("Apple's policies harm every facet of our business.").)

316. Apple has recognized that the high costs it imposes on developers harm innovation.

- a. Many businesses—including small businesses—cannot afford to absorb Apple's commission rates, whether 30% or 15%, and cannot afford to pass

the costs on to consumers without losing users. (Ex. Expert 1 (Evans) ¶ 275.)

- b. Apple recognized this reality since the early days of the App Store. In a 2011 email to Mr. Cue and Mr. Schiller, Mr. Jobs acknowledged that paying Apple's App Store commission "is prohibitive for many things." (PX-438.1 (Mr. Cue noting that "[t]he problem is many can afford 30% but others will say they can't"); Ex. Depo. 3 at 333:16-334:9 (Cue).)
- c. When Apple ultimately announced the Small Business Program, Apple stated that it expected the reduced commission would enhance innovation. (DX-4096.1 ("Apple announces App Store Small Business Program").)

317. Apple's conduct further harms innovation by preventing new and innovative distribution models on iOS that could benefit developers and consumers.

- a. Apple blocked the entry of web app stores. (PX-111; Ex. Depo. 2 at 175:4-176:7 (Shoemaker).)
- b. Apple blocked the entry of app streaming services as native apps, forcing them to enter only as inferior web apps. (Patel Trial Tr. 430:10-434:17; Wright Trial Tr. 579:1-10.)
- c. Apple blocked various "store within a store" models, including apps from Big Fish, Amazon, Tribe and others. (PX-115.1 ("Big Fish Unlimited is seen as a game store within an app. This is not allowed. . . . We have no clear guidelines around this."); PX-301.1 ("This is an ERB ruling and the

[Tribe] app will be hidden for being a store without our store. . . .

Unfortunately, the app has been live since 2015 so this is shocking for them . . .”); PX-191; Ex. Depo. 17 at 237:2-237:5 (Oliver).)

- d. Apple blocked competing app stores, including EGS. (Sweeney Trial Tr. 97:24-98:4 (“[O]ur Epic Games Store business is harmed by Apple’s policies because we are barred from introducing a version of our store for iOS.”).) This has prevented the Epic Games Store from accessing a market with over one billion users. (Allison Trial Tr. 1234:2-8 (noting that although “[m]obile devices have billions of players at the end of the screen” and that “[i]t’s an incredibly large total addressable market”, Epic is “not able to go after that addressable market with the growth plan” because of Apple’s restrictions).)
- e. Apple prevents developers from offering iOS apps for download directly from developer webpages. (Simon Trial Tr. 392:6-17 (noting that the Down Dog app is only available through the App Store, but “if users could visit our website and install directly from our website, we would support that.”).)

318. Apple’s 30% commission harms innovation by limiting investment.

(Sweeney Trial Tr. 92:8-13 (“Apple is in possession of this 30-percent commission. In my experience [it] is a really significant economic drag on the economics of the products, which certainly impacted Epic’s pricing decisions and led to . . . the ability to . . . reinvest less in our

business than we otherwise would have been able to if the commission weren’t present.”); *see also* Sweeney Trial Tr. 92:20-22 (“Apple’s policies had, in many ways, prevented us from implementing the sorts of features that we wanted in *Fortnite* that we had been able to implement on other platforms.”).)

a. This is especially true for game developers, whose mandated contributions effectively subsidize all other developers who pay either lower or no commissions to Apple. As Mr. Cook testified, the majority of App Store revenue comes from games, and such games provide “some sort of subsidy” to the remaining “bulk of the apps on the App Store[, which] are free”. (Cook Trial Tr. 3987:9-10, 3988:15-24.)

319. Finally, Apple’s conduct harms innovation by insulating the App Store from competitive pressures. As a result, Apple has been able to offer poor services to developers with impunity. Several examples follow.

320. First, Apple claims that it “curates” the App Store. The volume of apps on the App Store—1.8 million—undermines this claim. (Cook Trial Tr. 3926:3-3928:3.)

321. In light of the staggering number of apps available on the App Store, developers are not satisfied with the search and discoverability functionality of the App Store, as Apple has been slow to adopt innovations in search technologies. (Sweeney Trial Tr. 90:14-18 (“[O]ne of the things that made the biggest impression . . . was when Apple entered a search ad so that . . . a user searching for *Fortnite* saw an ad for a third-party game come up above the listing for *Fortnite* . . .”); Ex. Expert 1 (Evans) ¶¶ 191-92 (noting that a May 2017 Apple survey

of iOS app developers found that only 36% of U.S. developers expressed satisfaction with whether the App Store “[e]nables discovery of my apps”); Evans Trial Tr. 1557:2-4 (“Research and development . . . generate[s] innovation.”), *id.* at 1559:4-8 (Apple documents reveal that Apple has invested little in research and development); DX-3922.072 (May 2017 Apple survey showing that only 36% of U.S. iOS app developers agree that the App Store “[e]nables discovery of my apps”); DX-3800.077 (March 2015 Apple survey showing that only 34% of U.S. iOS app developers agree that the App Store “[e]nables discovery of my apps”); DX-3781.54 (July 2010 Apple survey showing that only 31% of developers were satisfied with the “[v]isibility of your app on the App Store”).)

- a. Discoverability refers to the way in which users can find apps in the App Store and how developers can make their apps known to, and discoverable by, users. (Evans Trial Tr. 1560:17-25 (“[Search and discovery technology is what enables consumers to find apps that they are interested in and it’s the technology that developers rely on to make sure that consumers can find their apps.”), *id.* at 1561:3-6 (“I concluded that . . . developers perceived significant problems with search and discovery in the App Store and that that set of problems has persisted really for the past decade.”).) In 2017, Apple’s own developer surveys found that only 36% of developers were somewhat or very satisfied with the App Store’s search and discoverability features. (DX-3922.072.) The remaining roughly two-thirds of developers were dissatisfied or neither satisfied nor

dissatisfied. (Evans Trial Tr. 1561:17-1562:4; DX-3922.072.) This survey is consistent with other years (DX-3800.077 (2015); DX-3781.54 (2010)), and with the study of App Store R&D, which shows that Apple is not investing in “a core technology” of the App Store. (Evans Trial Tr. 1562:5-18.)

- b. One way for apps to be discovered on iOS is through Apple’s “charts”, which list the most popular apps in certain categories. (Fischer Trial Tr. 934:4-16.)
- c. “Chart gaming” refers to a form of fraud whereby developers can “manipulat[e] . . . inputs to the charting level for them to appear more popular”. (Ex. Depo. 6 at 137:11-17 (Friedman).)
- d. Mr. Friedman, whose team was tasked with identifying instances of “chart gaming” in the App Store, stated that Apple’s discovery features do little to help users and developers, as such features are fraud-ridden: “[O]ur App Store charts aren’t really a discovery tool at all. Yes, they do drive some conversions, but that is (I suspect and haven’t verified) mostly the bots and/or humans responding to incentives from promotional companies”. (PX-254.1; Ex. Depo. 6 at 136:2-18, 141:12-142:3 (Friedman).)
- e. Another way by which apps are discovered is through search functionality. Developers, however, have been widely dissatisfied with the App Store’s

search functionality for years, as reflected in multiple surveys conducted by Apple over the years. (Evans Trial Tr. 1561:1-1562:2; DX-3922.072; PX-2284; DX-3800.077; PX-2062.1)

- f. After Tim Cook acknowledged that Apple “need[ed] to do much more to improve discovery” in response to a developer complaint in 2015 (PX-0089.2), Apple subsequently introduced Search Ads in 2016. (Cook Trial Tr. 3889:16-3890:2.) But developers’ dissatisfaction with the search functionality was only enhanced by Apple’s introduction of paid search advertising on the App Store. Specifically, Apple sells ad space to competitors, such that when a user searches for “Tinder”, for example, he or she may first be presented with competing apps rather than the app they had searched for. (Ex. Depo. 1 at 59:14-16, 59:18-60:14 (Ong); PX-2062.1 (“Search in the app store is still really rough around the edges”; “App Store is plagued with low-quality apps that makes it harder for higher quality apps to get the exposure they need”; “Apple store needs to have a ‘smart search’ ability [as] [h]aving to require customers to spell names exactly correct in this age is ridiculous for a multi-billion dollar company.”))

- 322. Developers are likewise dissatisfied with Apple’s promotion of apps.
 - a. In Match Group’s experience, Apple’s App Store promotions do not drive a meaningful number of users to find its Tinder app; rather, users

overwhelmingly already know they want to download Tinder when they access the App Store. (Ex. Depo. 1 at 56:3-56:4, 56:6-57:1 (Ong).)

- b. Match Group's data indicates that [REDACTED] of Tinder's iOS downloads were from users who were specifically looking for Tinder. (Ex. Depo. 1 at 58:20-59:13, 152:4-152:23 (Ong).)
- c. Apple's data indicates that as of March 2020, 79 million downloads, or 69% of the iOS total downloads of *Fortnite*, were the result of users searching for *Fortnite* in the App Store, whereas downloads resulting from Apple's "Games" or "Today" tabs accounted for only 19% of downloads. (PX-634.2.)
- d. In addition, after a user has downloaded an app, Apple does nothing to market or promote in-app purchases. (Ex. Depo. 1 at 60:15-60:18, 60:20 (Ong); *see also* Weissinger Trial Tr. 1314:19-23.)
- e. In surveys generated by Apple, developers have expressed frustration with Apple's preferencing of certain apps over others. (PX-2062.2-3 ("stop playing favorites"; Apple "tend[s] only to feature indie apps and apps that spend or earn the most money"; "[y]ou give everything to the big money makers"); Fischer Trial Tr. 887:4-25, 889:15-17.)

323. Numerous developer surveys conducted by Apple confirm broad dissatisfaction with the App Store's promotion, search and discovery features, among other things. (*See* DX-3877 (March 2010 iPhone Developer Program Satisfaction Survey); PX-2300

(March 2015 App Store Developers Profiling Research); PX-2284 (July 2016 US App Store Developer Survey); DX-3922 (May 2017 Developer Study), DX-3513 (July 2018 Developer Survey Results China, India, Japan, UK and US); PX-2062 (Summary of Developer Write-In's from July 2018 Survey).)

324. At trial, Apple's witnesses attempted to distance themselves from Apple's own surveys of developers. While he claimed to not recognize or recall them (Fischer Trial Tr. 976:23-978:16-21), Matt Fischer was shown several Apple App Store developer surveys and presentations that had been produced by Apple and by Apple's counsel as exhibits to be used in his examination. (DX-3781; DX-3800; DX-3922.) These surveys show the following:

- a. Even as early as 2010, developers expressed dissatisfaction with both the App review process and discoverability on the App Store. (DX-3781.59.)
 - i. In 2015, the vast majority of survey respondents gave the App Store low ratings for profitability, discoverability and marketability. (DX-3800.74.)
 - ii. A slide presentation for Phil Schiller summarized the 2016 survey results: "Developers don't believe that the App Store enables profitability of their apps, enables app discovery, or provides the tools to successfully market their apps." (PX-2284.6.)
 - iii. A May 2017 Apple survey of U.S. iOS app developers found that only 38% agreed that the App Store "[e]nables

profitability of my apps”; only 35% agreed that the App Store “provides the tools I need to successfully market apps”; and only 36% agreed that the App Store “[e]nables discovery of my apps”. (DX-3922.70, .72, .74.)

D. Apple Self-Preferences Its Own Apps.

325. Apple further harms competition by using its control over all iOS app distribution to self-preference its own apps at the expense of competing apps. As Apple’s CEO acknowledged, Apple is the only entity that can make recommendations or feature apps on the App Store. (Cook Trial Tr. 3929:1-8.)

326. Apple’s excessive commissions raise the cost of rival apps and put such rival apps at a competitive disadvantage vis-à-vis Apple. (PX-99.5-6; Ex. Depo. 2 at 75:14-76:5 (Shoemaker).)

327. Apple has self-preferenced its own apps through the app review process.

- a. Through App Review, Apple has learned details regarding third-party apps, which Apple has used to develop competing iOS apps. (Ex. Depo. 2 at 84:16-85:8, 480:7-480:15 (Shoemaker).)
- b. In addition, “competing apps” or apps that “arguably . . . compete with Apple in some way or another” have “faced a lot of barriers” to approval during App Review. (Ex. Depo. 2 at 76:6-77:2 (Shoemaker); PX-119.99.)
- c. Apple has used the App Store “as a weapon against competitors” (PX-99.5; Ex. Depo. 2 at 75:14-76:5 (Shoemaker)) and has rejected or delayed

competing apps on “pretextual grounds” (Ex. Depo. 2 at 88:2-8 (Shoemaker)). For example, Apple did not approve Google Voice—a calling app that Apple speculated could make “phone number[s] disappear”—for about a year after it initially went through the App Review process. (Ex. Depo. 2 at 76:13-25 (Shoemaker).) The delay in approval was attributed to internal concerns that the iPhone would “disappear . . . in [the] guise of a Google phone”. (Ex. Depo. 2 at 76:13-76:25 (Shoemaker).)

- d. In another instance, an app that was compatible with a competitor to the Apple Watch was halted in App Review for several weeks. (Ex. Depo. 2 at 490:13-491:7 (Shoemaker).)
 - e. Some app reviewers believed that Apple would not want to approve apps that compete against Apple. (Ex. Depo. 2 at 491:17-21 (Shoemaker).)
 - f. According to the former head of App Review, Apple’s senior executives would find pretextual reasons to remove apps from the App Store, particularly when those apps competed with Apple services. (Ex. Depo. 2 at 230:03-25 (Shoemaker); PX-119.367.)
328. Apple has prioritized the discoverability of its own apps.
- a. In May 2016, Apple employees considered featuring on the App Store certain “Google and Amazon apps” that were accessible to individuals with visual disabilities. Tanya Washburn, the App Store’s Director of

Operations, asked these Apple employees “to exclude [the Google and Amazon apps] from the [VoiceOver] lineup” because “[a]lthough they may be our best and the brightest apps, Matt [Fischer, Vice President of the App Store,] feels extremely strong about not featuring our competitors on the App Store”. (PX-58.1; DX-3419.3 (describing the VoiceOver feature as an “accessibility tool for the visually impaired”); Fischer Trial Tr. 837:3-838:3.)

- b. In 2018, Apple prioritized its “Files” filesharing app over the competing “Dropbox” app. As a result, “Dropbox wasn’t even visible on the first page” of search results when a user searched specifically for “Dropbox” in the App Store. Instead, an Apple employee admitted that Apple had “manually boosted” its own Files app to “the top for the query ‘Dropbox’”. (PX-52.1-2.)
- c. Although Apple contends that it “do[es] not allow search ads from Apple’s products” (Schiller Trial Tr. 2819:13-14), App Store searches for terms such as “books”, “music” and “news” return Apple’s apps as the first non-ad results. (*See* PX-1854 (Apple Books is the first non-ad result); PX-1855 (Apple Music is the first non-ad result); PX-1856 (Apple News is the first non-ad result).)

329. Apple does not apply some of its own rules to its own apps.
- a. For example, Mr. Simon of Down Dog testified that, although Apple prevents third-party apps from using push notifications for marketing, Apple itself uses push notifications to promote its Apple Fitness app. (Simon Trial Tr. 388:18-24.)
 - b. In 2019, App Review rejected the LinkedIn app “for using the same language on their subscription call to action button that Apple uses in our own apps”. (PX-857.1.) In response to complaints by LinkedIn that it was not permitted to engage in marketing that was seen for Apple’s own apps, Shaan Pruden, Senior Director of Developer Relations, wrote, “Developers (latest LinkedIn) cannot fathom why our apps are permitted to do things they are not” (PX-858.2; Kosmynka Trial Tr. 1028:11-1030:4.)
 - c. Amazon also “complain[ed] about this”. (PX-858.2; Kosmynka Trial Tr. 1029:20-23.)
330. Apple has historically rejected apps that provide “embedded games” because they are “not allowed” under the Guidelines. (PX-112.1-2.)
- a. In 2019, Apple announced Apple Arcade, a subscription games service, which competes with other game stores. (Fischer Trial Tr. 901:7-11.) Regarding this service, after his departure from Apple, Mr. Shoemaker commented, “[w]ith the new Apple Arcade announcement, it is making

available a type of app that Apple has consistently disallowed on the store.

But now it is OK for them to make this app available, even though it violates the existing guidelines?” (PX-99.6.)

b. Apple also repeatedly rejects similar features and functionality in other developers’ gaming apps.

- i. In 2011, the ERB asked Mr. Shoemaker “to hide” and “remov[e]” an app called Big Fish Games and offered “no guideline” as the basis for doing so. (PX-113.1-2; Ex. Depo. 2 at 180:22-181:12 (Shoemaker).) The app was rejected for being a store within a store. (PX-113.1-2; Ex. Depo. 2 at 180:22-181:12 (Shoemaker).)

E. Apple Has Rejected ‘Store Within a Store’ Apps for Anti-competitive Reasons, Not Because of Security Concerns.

331. Despite Apple’s policies, there are several apps on iOS that do offer (or have in the past offered) access to other apps, and thus constitute “stores within a store”. Regardless of the reason Apple allows these apps on the store, these apps have not caused any security issues. (Kosmynka Trial Tr. 1004:25-1005:2 (“Q. So That’s approximately three years that the Tribe app was on the App Store before the ERB ruling, correct? A. Correct.”), *id.* at 1005:10-15 (“Q. While it was on the App Store before it was removed for being a violation of the store-within-a-store guideline, you are not aware of any security issue arising with respect to Tribe while it was available on the App Store, right? A. I’m not aware of any issues outside this particular guideline issue.”).)

332. Tribe is an app store that was available through the App Store for a three-year period: 2015-2018. (PX-301.1; Kosmynka Trial Tr. 1004:25-1005:2 (“Q. So that’s approximately three years that the Tribe app was on the App Store before the ERB ruling, right? A. Correct.”).)

- a. Tribe is described as a “live multiplayer games platform”. (PX-301.1.)
- b. After being available for three years through the App Store, in 2018, Apple informed Tribe that it would be “hidden-deleted” because it violated Guidelines § 3.2.2 by being a store within a store. (PX-301.1.)
- c. The founder of Tribe, Cyril Paglino, complained that Apple’s explanation for removal was “vague” and that “Apple just changed its guidelines about applications that have onboarded mini games inside”. (PX-301.2.)
- d. There was no mention of security in either the message conveyed to Ms. Paglino or the Apple employee’s description of the reasons for the app’s removal. (PX-301.1-2.)
- e. Apple has not identified any security issue posed by Tribe during the time it was available on the App Store. (Kosmynka Trial Tr. 1005:24-1006:1 (“Q. So the answer is yes, you are no aware of any specific security issues with Tribe? A. Yes.”).)

333. At present, Apple knowingly has at least one store-within-a-store on iOS: *Roblox*. (Kosmynka Trial Tr. 1014:14-15 (“Q. And Roblox is still on the App Store today, right? A. That’s right.”).)

- a. Mr. Kosmynka, the head of App Review, testified that he did not view *Roblox* as a game. Kosmynka Trial Tr. 1012:1-3 (“Q. Roblox has a catalog of free games created by other users, correct? A. I don’t see it that way.”). Rather, he described the app as “an app in which users create a profile, hang out with their friends” and “can join in these experiences that [he] would look at as content.” (Kosmynka Trial Tr. 1015:12-25.) He testified, “I look at the experiences that are in Roblox similar to the experiences that are in Minecraft. These are maps. These are worlds. They have boundaries in terms of what they are capable of . . . And that’s what it is compliant with the rules today.” (Kosmynka Trial Tr. 1016:1-7.)
- b. *Roblox* also hosts experiences occurring within a three-dimensional world where players can gather, hang out with their friends, and navigate around worlds. (Kosmynka Trial Tr. 1126:19-23, 1127:18-1128:12.) *Roblox* offers similar modes to *Fortnite*. Like *Fortnite*, *Roblox* offers user-built content, Battle Royale and Creative modes, and it has also hosted virtual concerts. (Weissinger Trial Tr. 1297:6-24.)
- c. *Roblox* is extremely popular. (PX-2302.136 [REDACTED]
[REDACTED]
[REDACTED]

- d. Apple has “earned commissions from in-app purchases from” *Roblox*.
(Ex. Depo. 9 at 60:11-17 (Fischer).)
- e. In December 2014, *Roblox* was escalated to the ERB for the same “store within a store” issue. It was approved. (PX-305.1-2.)
- f. *Roblox* was approved even though the ERB recognized that “[t]he app is streaming games” that “don’t come into review”. (PX-305.1.)
- g. Apple is unaware of security issues introduced onto iOS as a result of *Roblox*. (Kosmynka Trial Tr. 1016:22-24 (“Q. You are not aware of any guideline violations by Roblox that implicate security concerns, right? A. Not at this time.”).)

334. In 2011, Apple rejected an app called “The Web Store” because it did “not want apps that replace[d] [its] store with web apps”. (PX-111.2; Ex. Depo. 2 at 175:4-176:7 (Shoemaker).)

335. That same year, and then again in 2013, Apple rejected apps offering game subscriptions developed by Big Fish, noting the Big Fish apps were “seen as a game store within an app”. (PX-115.1; Ex. Depo. 2 at 186:1-15 (Shoemaker).)

336. Apple has also rejected an app called WeChat, “a social network platform”, for being a store within a store. (Schiller Trial Tr. 3115:1-9.)

337. In fact, Apple has not conducted any studies of whether third-party app stores increase the security risks to iOS users. (*See, e.g.*, Kosmynka Trial Tr. 1007:9-17, 21-24

(“You were not aware of any study that was done of any apps that were downloaded through the Tribe store that related to security; isn’t that right? A. I’m not aware of any studies, no.”).)

338. Apple has acknowledged that rejections on this basis may be “anti-competitive”. (PX-191.4.)

- a. In April 2018, Amazon proposed offering a subscription service called “Amazon FreeTime Unlimited”, which it marketed as “a subscription for kids that offers unlimited access to over 10,000 kid-friendly videos, books and apps/games”. (PX-191.3.)
- b. In evaluating this app, individuals on Apple’s Business Management team expressed concern that “[f]rom a business perspective, the launch of this service raises strong concerns about the potential risk of cannibalization to our existing Kids’ business, as well as the loss of control of curation and discovery of our Kids catalog to FreeTime. This service may also pose a competitive threat to Apple’s current or future first-party subscription offerings”. (PX-191.5.)
- c. An Apple employee, Mr. Tom Reyburn, who was a point of contact with developers such as Amazon, acknowledged that these concerns “sound anti-competitive” and that “[t]he developers who participate with HTML5 games in the FreeTime app have chosen to make those games available through that app in addition to their direct app offerings. It’s up to customers to decide how they want to consume that content.” (PX-191.4.)

d. Ultimately, the ERB rejected this app on a number of grounds, including that it was considered a “[s]tore within a store”. (PX-2126.1.)

F. Apple’s Conduct Increases Barriers to Switching by Preventing the Development of Effective Middleware.

339. In economic terms, middleware is any technology that reduces the cost of a user switching between operating system platforms, whether completely or by mixing-and-matching devices with different operating systems, or that reduces the cost for developers of developing apps compatible with multiple operating systems. (Athey Trial Tr. 1772:11-16 (“Middleware is a technology that facilitates users and developers interacting across platforms . . .”); Ex. Expert 4 (Athey) ¶ 47.)

340. Multi-platform app stores (*i.e.*, app stores that are available across multiple platforms, such as iOS and Android) could be an important form of middleware. (Athey Trial Tr. 1773:17-1774:9; Ex. Expert 4 (Athey) ¶ 49; Ex. Depo. 2 at 66:1-24, 67:6-9 (Shoemaker).)

a. For example, a multi-platform store could recognize a user’s purchases across platforms, which would allow the user to purchase an app once and use it on all of the platforms that are compatible with the multi-platform store. (Ex. Expert 4 (Athey) ¶¶ 50-51.)

b. A multi-platform store would also allow parents to set various parental controls for different devices across several operating systems. (Athey Trial Tr. 1764:1-10; Ex. Expert 4 (Athey) ¶¶ 31, 78; Schiller Trial Tr. 2963:3-10.)

- c. In turn, multi-platform stores could allow parents to purchase lower-cost smartphones or tablets for their children outside of the operating system(s) of the parents' devices, because parents would be better able to interact with their children's devices even though they use a different operating system than the parent's devices. (Ex. Expert 4 (Athey) ¶ 33; PX-407.1 (Craig Federighi: "I am concerned the iMessage on Android would simply serve to remove [an] obstacle to iPhone families giving their kids Android phones."); PX-892.2.)
- d. A multi-platform store would reduce certain duplicative platform-specific costs by allowing developers to: (i) manage a single store front; (ii) manage customers in a coordinated way; and (iii) submit updates across all platforms simultaneously (Ex. Expert 4 (Athey) ¶¶ 53, 61; Allison Trial Tr. 1224:4-1225:7.)

341. Apple recognizes the threat of multi-platform stores and other types of middleware and has taken active steps to prevent their emergence. Several examples follow.

342. By foreclosing all third-party app stores, Apple has prevented the development of multi-platform app stores. (*See, e.g.*, Sweeney Trial Tr. 97:24-98:4 ("[O]ur Epic Games Store business is harmed by Apple's policies because we are barred from introducing a version of our store for iOS. So we can operate on PC and Mac, but we cannot, because of Apple's policies, distribute apps on iOS, and that locks us out of a very large worldwide business we would love to be in."); Athey Trial Tr. 1837:24-1838:1.)

343. Apple has likewise foreclosed other multi-platform development platforms. For example, Apple has declined to allow on the iPhone a multi-platform widget engine that Yahoo sought to build for the iPhone in 2008, Sun Java, Adobe Flash, Microsoft Silverlight and Qualcomm Brew, all of which are cross-platform developer tools. (PX-882.1; Ex. Depo. 4 at 183:22-184:7, 192:23-194:8, 194:21-22, 195:1-10 (Forstall).) Mr. Schiller summarized Apple's decision not to support the Yahoo engine as follows: "we have a way to do Widgets that competes with theirs, so who cares?" (PX-882.1; *see also id.* ("With one API (ours) we can manage what is on our products and what is not. If we open it up then we don't sign all apps, we don't distribute all apps, etc. Which is the same as throwing out the whole plan we have in place."); Ex. Depo. 4 at 192:23-194:8 (Forstall).)

Apple further banned the use of any and all cross-compilers (compilers that can be used to write to multiple platforms at once) to write apps for iOS. (Ex. Depo. 4 at 196:4-7, 198:10-14 (Forstall).) At the time, an article in *Business Insider* noted: "We're tempted to wonder if this change will make its platform less popular with developers. But we won't, because, for better or worse, when a platform can present so many attractive users the way Apple's iPhone can, developers tend to get in line—no matter how much they don't want to." (PX-883; Ex. Depo. 4 at 196:12-24 (Forstall).)

VI. APPLE HAS AND EXERCISES MONOPOLY POWER IN THE MARKET FOR PAYMENT SOLUTIONS FOR ACCEPTING AND PROCESSING PAYMENTS FOR DIGITAL CONTENT PURCHASED WITHIN AN iOS APP.

A. There Is a Separate Aftermarket for Payment Solutions for Accepting and Processing Payments for Digital Content Purchased Within an iOS App (“iOS In-App Payment Solutions Market”).

344. In-app purchases permit app developers to offer extra content for purchase by app users, such as an extra level in a game or enhanced features in a fitness app, without the user having to leave the app to make the purchase. (Sweeney Trial Tr. 109:12-15 (“In-app purchase refers to the capability of a user to spend money within an app without having to leave the app and go to another place in order to get typically a benefit of some sort within the app.”); Ex. Depo. 4 at 252:24-253:11 (Forstall).)

345. In-app payment solutions are not substitutable with payment solutions for handling transactions outside of the app. (Sweeney Trial Tr. 110:15-18 (“In-app purchases are far more convenient than out-of-app purchases.”), *id.* at 335:6-9 (“[W]e appreciate that there is a huge amount of payment processing and customer friction associated with selling a user of an app an item outside of that app.”); Evans Trial Tr. 1643:15-1644:5.)

346. The goal of in-app purchases is to offer users transactions that are as frictionless and as easy as possible. (Sweeney Trial Tr. 109:12-15; Hitt Trial Tr. 2153:15-2157:25 (discussing payment frictions and noting that developers want minimal purchase friction); (Cook Trial Tr. 3911:3-15 (“And would you agree with me, then, that one of the benefits of IAP for your customers is that it makes it easier for them to make purchases? A. It would.”), *id.* at 3912:11-17 (“So fair to assume, sir, that Apple would prefer that people make

their purchases in the app so that Apple can earn some revenue and there can be a good user experience . . . rather than have people go outside of the app? . . . A. Well, we try to make it as easy as possible.”); Rubin Trial Tr. 4018:14-25 (“[O]ne of the benefits of IAP is that it provides a frictionless experience; isn’t that right? A. Yes.”).)

347. Even where developers offer the same digital content for sale both in-app and outside the app, completing such sales outside the app—whether through a web browser on an iOS device or on a separate device—introduces substantial friction by requiring the user to go through multiple steps, including: leaving the app; identifying the alternative platform where relevant purchases can be made; navigating to the relevant website or app on that alternative platform; logging in to the user’s account; locating the content the user is interested in purchasing; entering payment credentials (typically required at least for an initial purchase); logging out of the alternative platform; and going back into the app. (Sweeney Trial Tr. 110:18-111:1 (“Users in *Fortnite* . . . [when] they see an interesting cosmetic item available, in-app purchase makes it possible for them to buy it immediately with just a few taps on their screen; whereas out-of-app purchase would require the player to leave *Fortnite*, perhaps open a web browser, navigate to a web page, and separately make a purchase there. Perhaps have to log in separately as well. So out-of-app purchase has far more friction than in-app purchase.”); Weissinger Trial Tr. 1304:25-1305:21.)

348. Moreover, Apple could not prove that there was insignificant friction associated with making game content purchases outside of a native app. When confronted in court with some of the frictions associated with purchasing iOS game content on a web browser

on an iOS device, Apple’s expert Professor Hitt could not explain how to make one of the “frictionless” web browser purchases he had testified about, instead stating that he would need to consult his research team in order to do so. (Hitt Trial Tr. 2219:20-2220:23, 2228:18-2229:6.)

When pressed by the Court on the difficulty of completing game content transactions outside of the iOS app that was evident from the demonstration, Professor Hitt could not provide “any logical explanation” for the friction encountered in the demonstration. (Hitt Trial Tr. 2228:18-2229:6.)

349. Apple also could not prove the availability of more than a few iOS games that allow users to purchase content outside of the iOS app. Despite touting users’ supposed ability to buy in-game content on an iOS web browser for 32% and 8% of the Top 25 iOS games by revenues and by downloads respectively (*see Ex. Expert 6 (Hitt) ¶ 51*), Professor Hitt was unable to back even these low numbers up in Court. Upon being shown a developer website that stated explicitly that one of the games that supposedly supported his availability statistics games did *not* support purchases outside of iOS and Android, Professor Hitt again could not explain the discrepancy. (Hitt Trial Tr. 2221:23-2222:19.)

a. Apple’s CEO also acknowledged that buying items on the web “takes another click to leave the app” (Cook Trial Tr. 3914:2-6), that IAP “makes it easier for [customers] to make purchases” (Cook Trial Tr. 3911:12-15, 3912:19-21), and that it would be “a negative user experience . . . if [customers] have to leave the app” to make purchases for in-app goods (Cook Trial Tr. 3912:4-6).

- b. Apple's expert, Dr. Rubin, also admitted that one of the benefits of IAP is that it provides a "frictionless experience" for customers. Specifically, Dr. Rubin testified that a member of the Apple engineering staff itself explained to him that IAP "minimizes the amount of effort that a consumer has to put in in order to make a purchase". (Rubin Trial Tr. 4018:14-4019:5.)
- c. The friction involved with leaving the app is a real cost. For example, Google pays Apple billions of dollars to be the default search engine on iPhone's Safari browser—a default that users can change with a few taps. (*See* PX-2391.86; Cook Trial Tr. 3979:14-3980:13.) The deal has value to Google because users are unlikely to go out of their way by changing the default search engine on their iPhone. (*See* Cook Trial Tr. 3915:17-3917:11.)

350. Accordingly, developers do not view payment processing solutions outside of iOS apps as interchangeable with in-app payment processing solutions.

- a. Convenience is particularly important for in-app purchases, many of which are small or time-sensitive. An extended delay may cause the consumer to change their mind. Consumers are less likely to make purchases if they have to leave the app to do so, meaning in-app purchases lead to more transactions and more

revenue for developers. (Sweeney Trial Tr. 109:12-15, 110:17-111:1, 334:17-335:9; Cook Trial Tr. 3911:3-18.)

- b. Consumers are more likely to stop engaging with an app if they have to leave the app to make a purchase. Therefore, developers view being able to offer in-app purchases as essential. (Sweeney Trial Tr. 336:25-337:3 (“Customer convenience is a huge factor in [in app purchasing]. People are much more likely to make a purchase if it is easy to make a purchase than if it’s very hard.”).)
- c. Despite claiming that app developers are highly incentivized to avoid the Apple commission by encouraging users to execute transactions outside of the native iOS app, Apple’s expert Professor Hitt could not identify a single developer other than Epic that encourages its users to transact outside of the App Store. (Hitt Trial Tr. 2195:12-2196:19.)

351. At trial, Apple pointed to apps like *Fortnite* that support cross-progression, which allows users to transfer digital content within an app across platforms, and cross-platform currency, which allows users to transfer digital currency within an app across platforms. (Sweeney Trial Tr. 299:9-25, 232:18-233:1.) Although users and developers can theoretically bypass Apple’s IAP with these features (*see id.*), these features do not discipline Apple’s conduct.

- a. Apple did not attempt to prove that many or most apps on iOS support cross-progression or cross-platform currency.
- b. Apple did not produce contemporaneous evidence that the availability of cross-progression or cross-platform currency on iOS caused Apple to consider changes to its IAP requirements.
- c. As explained above, purchasing digital content outside of an app entails significant friction. As a result, even for an app like *Fortnite* that supports cross-progression and cross-platform currency, the “large bulk” of purchases of digital content for *Fortnite* come from buying within the app as opposed to purchasing V-Bucks outside of *Fortnite*. (Weissinger Trial Tr. 1302:16-21.)
- d. Even where the same apps are available on iOS and a game console, few view transactions on an iPhone as reasonably interchangeable with transactions on a console. Ms. Wright of Microsoft, for example, testified that the App Store does not compete with the Xbox Store, and transactions in apps such as *Minecraft*, *Roblox* and *Fortnite* on Xbox are not substitutes for transactions in those same apps on iOS. (Wright Trial Tr. 548:24-549:25.)

352. Multiple third party payment solution providers offer in-app payment processing solutions for app developers, including Stripe, Amazon Pay, Braintree, PayPal, Chase Paymentech (“Chase”), Checkout.com, Adyen and Square. (Ko Trial Tr. 803:2-6; PX-2452.3; Fischer Trial Tr. 907:4-12; Simon Trial Tr. 353:3-7.) These online payment solution providers compete with each other along a number of dimensions, including their “technical sophistications, user experiences, operational excellency, and their service level commitment”, meaning “24 by 7, 365 days of operational working conditions”. (Ko Trial Tr. 806:14-21; PX-2451.1, .25, .28, .30, .39; PX-2452.5-6.) They also compete on “conversion ratios”—the rate at which legitimate transactions are successfully processed—as well as processing costs. (Ko Trial Tr. 803:7-18, 807:10-16; PX-2452.5-6, .10.) Additionally, payment solution providers compete on the basis of fraud and chargeback rates, meaning the percentage of transactions that are reversed on the basis that the customer has asserted they were not authorized. (Ko Trial Tr. 804:18-805:17; PX-2451.33-34; PX-2452.3.)

353. Apple requires developers to use Apple’s payment processing interface, known as the In-App Purchase (“IAP”) API, for all in-app purchases of digital goods within iOS apps. (PX-56 (App Store Review Guidelines) § 3.1.1.)

354. Because transactions outside the app are poor substitutes for in-app purchases, a hypothetical monopolist could profitably impose a SSNIP on fees for payment processing solutions used to execute in-app purchases of digital content within iOS apps. (Ex. Expert 1 (Evans) ¶ 263; Evans Trial Tr. 1602:23-1603:11, 1717:25-1718:13.)

- a. In fact, Apple is such a monopolist and profitably charges an order of magnitude more for payment processing services for in-app transactions on iOS involving digital goods than would competing providers of payment solutions. (Ex. Expert 1 (Evans) ¶ 267; Evans Trial Tr. 1605:7-11; *cf.* Ko Trial Tr. 806:25-806:9 (Epic pays 3.5% average in the U.S. and 4.2% average worldwide).)
- b. Dr. Evans performed a SSNIP test by considering a situation in which Apple did not impose its payment processing restrictions, and developers could choose between IAP and their own payment processing solutions. (Ex. Expert 1 (Evans) ¶¶ 258-265; Evans Trial Tr. 1607:7-25.)
- c. Dr. Evans assumed a 5% average fee for non-IAP payment processing solutions chosen by developers. He then considered what would happen if developers accounting for just 20% of in-app transactions would choose to use their own payment processing solutions, with those accounting for the remaining 80% of in-app transactions using IAP at Apple's 27.7% effective commission rate. That would decrease the average commission rate in the market to 23.2% (the weighted average of 5% and 27.7%). (Ex. Expert 1 (Evans) ¶ 261; Evans Trial Tr. 1607:7-1608:8.)

- d. By eliminating that choice for developers, the hypothetical monopolist would maintain its 27.7% average commission, which is 19.4% higher—well above a SSNIP. (Ex. Expert 1 (Evans) ¶ 262.)
- e. None of Apple’s experts performed a hypothetical monopolist test. (*See* Lafontaine Trial Tr. 2051:7-13 (“Q: You also did not do a conceptual hypothetical monopol[ist] test, correct? A: The boundary between doing one of those in your head and kind of thinking through it and not is a little bit fuzzy to me, so I have difficulty being very—so I had—again, I’ll just say no.”); Schmalensee Trial Tr. 1929:3-14; Hitt Trial Tr. 2185:23-2186:3.)

355. The relevant geographic market is global, with the exception of China. (Ex. Expert 1 (Evans) ¶ 266.) To serve customers around the world, developers require payment solutions to work in many countries. The payment processors they hire to help them do that often provide services in many different countries, and country coverage is one of the dimensions on which payment processors compete. (Ex. Expert 1 (Evans) ¶ 266.)

- a. Because of regulations imposed by the government, the Chinese payment processing market is insular. Developers outside of China do not use Chinese payment processors and China payment companies typically only serve the Chinese market. (Ex. Expert 1 (Evans) ¶ 266.)

B. There Is Separate Demand for In-App Payment Solutions.

356. To determine whether two products are separate, economists generally assess whether there is separate demand for each. (Evans Trial Tr. 1597:2-8.)

- a. There is demand for in-app payment solutions that is separate from app distribution. (Sweeney Trial Tr. 93:15-19 (“Epic is simply seeking the ability for other payment systems to compete with . . . iOS so that developers can choose freely among them.”); *id.* at 157:11-14 (“[S]ubsequent to the implementation of the hot fix . . . users actually transacted [] business through Epic Direct Pay[.]”), *id.* at 159:2-4; Ex. Depo. 1 at 45:1-46:10, 46:13-15, 46:17-47:7 (Ong).)

357. Developers, including Epic, wish to use their own payment processing solutions over Apple’s IAP. (Sweeney Trial Tr. 128:14-17 (“Epic introduced Epic Direct Payment into *Fortnite* on iOS. And it is a general service that we would like to make available to other developers in the future if we were allowed to.”); Ex. Depo. 1 at 39:16-24, 41:12-42:9 (Ong).)

- a. Apple has rejected thousands of apps from distribution on iOS for violating Guidelines § 3.1.1. (*See* Kosmynka Trial Tr. 1022:20-22 (“Q. In fact, there have been thousands of guidelines 3.1.1 rejections, right? A. That’s right.”); Schiller Trial Tr. 3109:5-9 (“And if those alternative payment processing methods related to

an app that was selling digital consumable content, then the app would be rejected, correct? A. If it's content that's digital and consumed on our devices."); PX-300.6 (2017 iOS Apps Reviewed Summary); PX-2790 (App Store Review Guidelines) § 3.1.1; Fischer Trial Tr. 905:22-906:4.)

- b. Thousands of developers have been specifically terminated since 2017 on the basis of incorporating a third-party payment mechanism into their app. (Kosmynka Trial Tr. 1026:15-21.)
- c. In 2012, Microsoft requested to "handle signing up or subscriptions for Office from within their iOS app" "[i]nstead of using IAP" in order to "have a consistent experience for signing up users". (PX-46.1; Ex. Depo. 7 at 349:2-3, 349:8-10, 352:18-24 (Okamoto).) Microsoft offered to pay Apple the full 30% commission Apple demands for using IAP, so that Apple would "receive a portion of the revenue as . . . if [Microsoft] used IAP". (PX-46.1.) In response, Phil Schiller stated that there was not "any chance" that Apple would agree because "[w]e run the store, we collect the revenue". (PX-46.1.)
- d. Match Group developed its own payment processor for Tinder on Android, which Match Group would use on iOS if it were permitted to do so. (Ex. Depo. 1 at 41:12-42:9 (Ong); PX-865.2.)

However, Match Group is “forced to use Apple’s in-app payment system”, because its app “will not get approved” by Apple if Match Group introduced its own payment system. (Ex. Depo. 1 at 37:25-38:11, 38:13-39:2, 39:16-24 (Ong).)

- e. Google has requested to opt out of IAP for Google Drive. (PX-827.3.) Apple “rejected the Google Drive app (cloud storage) from the App Store for not offering the purchase of additional storage space through the app as they do through the Google website”. (PX-827.3.)
- f. Apple rejected Epic’s *Fortnite* app and terminated Epic’s developer account when Epic enabled Epic direct payment. (Sweeney Trial Tr. 148:17-22, 156:24-157:4.)
- g. Apple rejected Basecamp’s Hey app for using a non-IAP billing method. (Schiller Trial Tr. 3035:11-3036:14; PX-2338.1.)

358. Developers have many reasons for wishing to use alternative payment solutions aside from the level of Apple’s commission, including the ability to offer specific services precluded by Apple’s IAP. (Ex. Expert 1 (Evans) ¶¶ 282-283; Evans Trial Tr. 1567:24-1568:19; Ex. Depo. 1 at 34:14-37:7, 39:16-39:24 (Ong).) Developers would benefit from competition among payment processors and could solicit bids from various third parties that provide unique services to match the developer’s own needs. (Evans Trial Tr. 1565:23-1566:8; PX-2452.3.) For instance, customized risk management and fraud protection tools, more flexible

pricing structures, access to relevant commerce and payments data, visibility into the developer’s payments stream, and the ability to provide direct and comprehensive customer service, all could be offered by alternative payment solutions. (PX-2452.5-7; Ex. Expert 1 (Evans) ¶¶ 267, 279, 282, 283; Evans Trial Tr. 1609:23-1610:6; Simon Trial Tr. 355:5-12; *see also* Sections VIII.C-VIII.G below.)

359. When given a choice, developers prefer using payment processing and related services from third-party vendors rather than from Apple for in-app purchases on iOS apps. (Simon Trial Tr. 376:17-23 (third-party vendors like Stripe and PayPal “provide[] a better payment processing service” than Apple).)

- a. iOS apps offering in-app purchases of physical goods—such as Uber, Lyft, and Postmates—utilize third-party payment processing solutions and related services. (PX-2235.4 (Uber informing Apple that a “30% fee on any physical good business has massive margin impact and becomes impossible to sustain”); PX-201.1 (“[T]he team has spoken to several developers [including Uber and Lyft] and they’ve consistently pushed back on the 30% commission . . .”).) The Starbucks app, for example, can utilize its own third-party payment processor instead of IAP. This also allows full control over the relationship with the customer, including providing customer service directly to the user where issues arise. (Evans Trial Tr. 1569:20-1571:1.)

- b. In fact, many of the most significant apps, including Grubhub, Wish, StubHub, Uber, DoorDash, Lyft, Instacart, Postmates, Amazon Shopping, Walmart, eBay, Amazon Prime Video, Altice One, and Canal+, procure payment processing services from sources other than Apple, *i.e.*, separately from the distribution services they are forced to obtain from the App Store. (Ex. Expert 1 (Evans) ¶¶ 235, 238.)
- c. In June 2018, Apple sought to force Uber and Lyft to adopt IAP for their newly-introduced subscription services. Both developers objected. Uber “balked at the 30% rev share”, and relayed concerns that “Uber operates on slim margins, as do many of these physical goods and services developers”. (PX-422.1.) Members of Apple’s business development team acknowledged that Apple’s “current commission structure will be a key sticking point for these types of developers to adopt IAP”. (PX-422.1.) Apple ultimately allowed these developers to use IAP as an option; Uber and Lyft elected not to use IAP for their subscription services. (PX-201.3

[REDACTED]
[REDACTED];

PX-202.1 (“Trystan [Kosmynka] confirmed that IAP was optional for the membership subscriptions”); Evans Trial Tr. 1599:7-19.)

In response, Matt Fischer, Vice President of the App Store, conceded that “[u]nfortunately, IAP being ‘optional’ means that no one will ever use it”. (PX-202.1.)

- d. Under Apple’s Video Partner Program, iOS developers that offer premium video entertainment apps on both iOS and tvOS are permitted by Apple to integrate non-IAP payment solutions for certain transactions, and many do so, including Prime Video, Altice One, and Canal+. (DX-5335.16; Schiller Trial Tr. 2806:5-2807:21; Ex. Expert 1 (Evans) ¶ 235.)
- e. Down Dog uses Stripe and PayPal to process subscription payments through its website, and it would prefer to use those services on iOS. (Simon Trial Tr. 374:2-6, 376:24-377:2.) These payment processors provide better service and more features to Down Dog—such as the ability to issue refunds, cancel and manage subscriptions and provide direct customer service—and charge approximately 10% of Apple’s commission. (Simon Trial Tr. 374:22-375:9, 376:10-377:2.) Moreover, when using payment processors like Stripe and PayPal, small developers like Down Dog do not have to house sensitive consumer financial information (such as credit card numbers) on their own servers—Stripe and PayPal collect and manage this information directly and handle

compliance with associated consumer protection regulations.

(Simon Trial Tr. 375:6-23.) Down Dog has never experienced any type of security issue caused by the fact that users subscribed on the web (and therefore had their payments processed by Stripe or PayPal) rather than through iOS. (Simon Trial Tr. 375:24-376:9.)

360. There are also non-price reasons why consumers prefer alternatives to IAP, including access to a wider range of payment options, the cross-platform ability to obtain purchase history and pay using the same credentials, enable family sharing, and set persistent parental control and other settings. (Ex. Expert 4 (Athey) ¶¶ 31, 78; Ex. Expert 1 (Evans) ¶¶ 276-85.)

- a. As discussed above, payment solution providers compete on the basis of their “technical sophistication, user experiences, operational excellency, and their service level commitment”—*i.e.*, the ability to provide quality, round-the-clock customer service. (Ko Trial Tr. 806:14-21; PX-2451.1, .25, .28, .30, .39; PX-2452.5.)
- b. Some payment processors are better than others at maintaining low fraud and chargeback rates. (Ko Trial Tr. 804:18-805:17; PX-2451.33-34; PX-2452.3.)
- c. Other payment processors provide better refund services, [REDACTED]
[REDACTED]
[REDACTED]. (Ex. Depo. 1 at 48:21-51:06 (Ong).)

361. Many users, when given a choice, would and do use third-party payment solutions over IAP for in-app purchases on iOS apps.

- a. Millions of iOS users use third-party payment solutions for in-app purchases, in iOS apps, of non-digital goods and services.
- b. “Black market” app stores in China offer a variety of payment options. (PX-256.2.)
- c. Black market app stores arose in China in part because IAP offered particularly poor service to Chinese iOS users—specifically, alternative stores offered consumers “better penetration . . . of payment instruments that were popular with Chinese customers”. (Ex. Depo. 6 at 148:24-149:15 (Friedman).)
- d. Black market app stores became so popular in China that, by 2014, internal Apple employees observed that “[a]t this point, in China, it appears that the Black Market is the market”. (PX-255.4; Ex. Depo. 6 at 155:5-6, 157:4-158:8 (Friedman).)
- e. One black market app store in China, Tongbu, “explicitly encourage[d] developers to upload their apps through tongbu.com”, citing the ability to “enjoy more flexible payment method[s], including AliPay (<http://alipay.com>), TenPay (<http://www.tenpay.com>) and many more” as one “advantage”. (PX-256.2.)

f. Match Group offers Tinder through the Google Play Store with payment processing from both Google and Match Group. (Ex. Depo. 1 at 43:4-10, 17-21 (Ong).) Although Match offers the same prices through both payment options, to date, Match Group's own payment processor has been more successful, [REDACTED]

[REDACTED]
[REDACTED]

[REDACTED] (Ex. Depo. 1 at 43:4-44:19, 45:1-46:10, 46:13-15, 46:17-47:7 (Ong).)

g. During the two week period when both Epic direct payment and IAP were offered on iOS, many *Fortnite* users opted to purchase in-app content through Epic's payment system rather than through Apple's IAP. (*See* Sweeney Trial Tr. 157:11-14 ("Q. Do you know whether subsequent to the implementation of the hot fix any users actually transacted any business through Epic Direct Pay? A. Yes.").)

362. Epic has offered for a number of years, and continues to offer, Epic direct payment for *Fortnite* players on Android. (Ko Trial Tr. 799:22-800:3.) Absent Apple's IAP requirement, Epic would continue to develop Epic direct payment for its iOS customers, including by customizing Epic direct payment to the needs of Epic and its customers and offering features and solutions not available in Apple's one-size-fits-all IAP solution. (Sweeney

Trial Tr. 93:15-19 (“Epic is simply seeking the ability for other payment systems to compete with . . . iOS so that developers can choose freely among them.”); Ko Trial Tr. 802:1-20 (Epic is developing various improvements to its payment system, including an “Epic Wallet” that could be used by a parent or other customer to store money for payments when using the Epic payment solution, and “smart pricing solutions” that would “protect developers from unpredict[ed] volatility of the foreign currencies”).)

C. IAP and the App Store Are Not Integrated.

363. The evidence shows that IAP and the App Store are not technologically integrated.

364. As discussed above (*see* Section II.F), during the time between the launch of the App Store in 2008 and the introduction of IAP in 2009, in-app payment processing and app distribution were entirely separate and iOS developers were monetizing their apps with in-app payment solutions that were self-provided. (Ex. Depo. 4 at 230:5-11, 230:16-18, 230:20-22, 230:24-231:2, 252:6-252:13 (Forstall); PX-1813.3; PX-1701.2; PX-1815.1-2; PX-1818.1; PX-1703.1-2; PX-1709.1.)

365. In addition, [REDACTED] [REDACTED] including “the iTunes Store on iOS, Apple Music, and iCloud or Cloud services” and “physical retail stores”. (Ex. Depo. 12 at 65:17-22, 66:23-67:2, 110:2-7, 110:9-15 (Gray); PX-523.12.)

366. But for Apple’s requirement to use IAP, in-app purchases would be direct transactions between developers and users of their apps, and would not involve the App Store at

all. There are functional differences between iOS app distribution and iOS in-app payment solutions.

- a. App distribution “involves the matching process between app users and app developers via search and discovery” provided by Apple. (Evans Trial Tr. 1596:8-21.)
- b. In-app transactions occur months or years after the app has been downloaded from the App Store and installed on a user’s device. (Evans Trial Tr. 1596:22-1597:1.)
- c. [REDACTED]
[REDACTED]
[REDACTED] (Ex. Depo. 12
at 114:4-6, 9-10 (Gray) [REDACTED]
[REDACTED]
[REDACTED].)

D. Apple Has and Exercises Monopoly Power in the iOS In-App Payment Solutions Market.

367. Apple conditions developers’ access to a billion iPhone users through the App Store on developers using Apple’s IAP for all in-app transactions involving the sale of digital content.

- a. Section 3.3.3 of the DPLA provides that without IAP or “Apple’s prior written approval”, apps may not “provide, unlock, or enable additional features or functionality through distribution

mechanisms other than the App Store”. (PX-2619.17 (DPLA)

§ 3.3.3.)

- b. Section 3.1 of Schedule 2 provides that “Apple shall be solely responsible for the collection of all prices payable by End-Users for Licensed Applications acquired by those End-Users under this Schedule 2”. (PX-2621.4 (Schedule 2) § 3.1.)
- c. Correspondingly, Section 3.4 of the DPLA forbids developers from “issu[ing] any refunds to end-users”, instead providing that “Apple may issue refunds to end-users in accordance with the terms of Schedule 2”. (PX-2619.52 (DPLA) §3.4.)

368. The Guidelines likewise restrict developers’ in-app payment solution options.

- a. Guideline § 3.1.1 contains the requirement that apps must use Apple’s IAP—and no other payment processor—to process payments for in-app purchases of digital content. It provides that “[i]f you want to unlock features or functionality within your app, (by way of example: subscriptions, in-game currencies, game levels, access to premium content, or unlocking a full version), you must use in-app purchase”. (PX-2790.10 (App Store Review Guidelines) § 3.1.1.)

b. Apple also has and enforces an anti-steering rule within this Guideline, which provides: “Apps and their metadata may not include buttons, external links, or other calls to action that direct customers to purchasing mechanisms other than in-app purchase.” (PX-2790 (App Store Review Guidelines) § 3.1.1; *see also* Schmalensee Trial Tr. 1890:2.5-6 (“[T]he App [S]tore has rules to . . . avoid steering.”); Schmid Trial Tr. 3276:19-3277:6 (“Q. I’m asking a yes or no question. It’s against Apple’s rules to tell users that they can go outside of the app and go make purchases of in-app currency, right? A. Correct . . . Q. Meaning if someone’s in the native app, they cannot be told within that app that there’s something they can do elsewhere to buy content. A. Correct.”).)⁹

⁹ In Dr. Lafontaine’s written direct, she testified that “[n]othing in Apple’s license restricts developers from offering transactions on other platforms or ‘steering’ consumers to other platforms by charging less on these platforms or more on the App Store”. (Ex. Expert 7 (Lafontaine) ¶ 48; *see also* Lafontaine Trial Tr. 2055:12-2056:3.) At trial, however, she admitted that “while developers can price differently on the App Store and other platforms, Apple does not allow developers to tell users in the app that they have done so”. (Lafontaine Trial Tr. 2056:8-12.) She also admitted that Apple forbids developers from providing “any kind of link in their iOS app to other platforms on which transactions can be had”, and that “Apple does not allow targeted communications like email to inform people of that either”. (Lafontaine Trial Tr. 2056:13-20.) Professor Schmalensee similarly conceded that Apple’s rules “prohibit[] targeted communications outside of the app to users, such as through email[s] that have been registered through the app”. (Schmalensee Trial Tr. 1911:1-12.) Professor Hitt testified that he does not know of any developer who “was actively trying or had actively tried to encourage users to make purchases outside of their game”. (Hitt Trial Tr. 2195:24-2196:19.)

c. Importantly, the newest version of the Guidelines contains broad anti-steering language that prohibits not only links within the app and calls to action within the app (which were already prohibited by the old Guidelines), but also imposes onerous newly concocted restrictions on developers that offer multi-platform apps. Specifically, these developers are prohibited from marketing non-App Store alternatives to consumers using information that the developer may obtain when the user creates an account for the developer's app on iOS. (PX-2790.11 (App Store Review Guidelines) § 3.1.3 (prohibiting developers from "encourage[ing] users to use a purchasing method other than in-app purchase" "either within the app or through communications sent to points of contact obtained from account registration within the app.").) This means that if a developer obtained a customer's phone number or email address when the customer signed up for the developer's app through the App Store, the developer is prohibited from marketing non-IAP alternatives to its own customers using that information. (PX-2790 (App Store Review Guidelines) § 3.1.3.).

369. Apple also requires developers using IAP to choose among Apple's pre-defined "price tiers". (Ex. Depo. 9 at 266:12-15 (Fischer).)

- a. The price tiers in U.S. dollars all end in \$0.99; the highest tier is \$999.99. (PX-2202.2)
- b. When a developer selects a price tier for one currency, Apple requires the developer to use the same tier for many foreign currencies. (PX-2202.2.)
- c. Apple changes the foreign currency prices in each tier from time to time at its sole discretion. (PX-545.1 (Mr. Cue: “as currencies decrease or increase, developer have to wait for us to take action”); Ex. Depo. 12 at 206:13-24, 206:25-207:18 (Gray) (“Q. Were the various pricing tiers initially . . . in sync with respect to foreign exchange rates in 2008 when they were first rolled out? A. Yes. They were all . . . And then when they go out of bounds from time to time, that’s when we make a price change to move them back within [a narrow] tolerance.”); PX-544.1-2.)

370. Consistent with these contractual restrictions, Apple has prevented the implementation of other payment solutions.

- a. In 2009, PayPal asked to be added to the iPhone SDK so that developers could easily choose to design apps that relied on PayPal to provide payment processing services. (PX-47.2; Ex. Depo. 7 at 358:18-19, 358:24-359:1 (Okamoto).)

b. Mr. Schiller rejected this and threatened to remove any such applications from the App Store: “If developers were to use an alternate mechanism for enabling additional features or functionality in their applications, such as via PayPal, they would be in violation of our developer program terms and we would not be able to distribute those applications in the App Store.”

(PX-47.1; Ex. Depo. 7 at 359:21-360:9 (Okamoto).)

c. As noted, Apple has rejected thousands of apps for violations of Guidelines § 3.1.1. (Kosmynka Trial Tr. 1022:20-22.)

371. Apple has set its 30% commission for in-app purchases without consideration of costs. (Ex. Depo. 3 at 141:13-20, 141:22-142:9 (Cue); Schiller Trial Tr. 3105:13-18 (“Now let’s talk about the 30 percent commission for a moment. You would agree with me that in connection with determining what that commission would be for in-app purchases, Apple did not consider costs? A. Correct.”).)

a. The competitive level of payment processing fees is around 3% in the United States. (Ex. Expert 1 (Evans) ¶ 259; Ko Trial Tr. 807:4-6 (noting that “within the U.S.”, Epic has “an average cost of . . . around 3.5 percent.”); Ex. Depo. 12 at 78:23-25, 79:3-8 (Gray) (“[T]he rates [that Apple pays to partners in the U.S. for processing credit card transactions] are generally low. Meaning . . . 1 to 2 percent”); Simon Trial Tr. 376:10-16 (Down

Dog pays “30 cents per transaction, plus 2.9 percent” to Stripe and PayPal for payment processing on the web version of its subscription-based app.)

- b. Epic offers developers selling apps through EGS the option of using Epic direct payment for their in-app purchases; Epic offers this service for a commission of 12%. (Sweeney Trial Tr. 125:13-16, 126:5-7.) This rate “is intended to cover all [of] Epic’s variable operating costs”; that is, “[t]he cost of processing an additional transaction”. (Sweeney Trial Tr. 126:5-11; *see also* Sweeney Trial Tr. 126:14-18 (“Epic makes a gross profit on the variable cost associated with a new purchase. We make more money from the 12 percent than it typically costs us to cover the cost of that additional purchase, but that does not account for all of the storage costs, such as marketing and exclusive products.”).)

372. Finally, Apple’s updated Schedule 2 (as of March 2021) contains a punitive provision that allows Apple to withhold funds due to developers and other developers who are affiliated with a developer deemed to have been engaging in behavior considered by Apple to be “improper” or “suspicious”, among other things.

- a. Specifically, Section 7.1 of the revised Schedule 2 provides, among other things, that “[i]f at any time Apple determines or suspects that [the signatory developer] or any developers with

which [the signatory developer is] affiliated have engaged in, or encouraged or participated with other developers to engage in, any suspicious, misleading, fraudulent, improper, unlawful or dishonest act or omission, Apple may withhold payments due to [the signatory developer] or such other developers.” (PX-2943.9 (Schedule 2) § 7.1).

- b. “[U]nder these new terms, Apple can withhold payments due to developers that were paid by consumers if Apple even suspects that a developer with which a developer is affiliated has engaged in suspicious behavior”. (Schmid Trial Tr. 3301:4-12.)
- c. On cross examination, Mr. Cook testified that he “had no idea that this language was added to the document”. (Cook Trial Tr. 3924:7-19.) On re-direct, Apple’s counsel prompted Mr. Cook to testify that “there was something in Japanese law that required it”. (Cook Trial Tr. 3968:25-3969:10, 3979:3-13.) But that was “the extent of [his] memory”. (Cook Trial Tr. 3986:14-22.) This testimony was not credible.

VII. APPLE HAS TIED TOGETHER TWO DISTINCT PRODUCTS—ITS APP DISTRIBUTION SERVICES AND ITS IN-APP PAYMENT SOLUTIONS.

373. Apple is a monopolist in the market for iOS app distribution. (Evans Trial Tr. 1603:7-11; *see* Part IV above.)

374. iOS app distribution is a separate product from payment solutions and related services. (Ex. Expert 1 (Evans) ¶¶ 220, 234.) There are “dramatic functional differences” between the two separate products. (Evans Trial Tr. 1596:8-13.) iOS app distribution “involves the matching process between app users and app developers via search and discovery, ultimately concluding with the ability of the user to download and then use an app”. (Evans Trial Tr. 1596:18-21.) In-app purchase “is something that happens later and that involves transactions that are between the app user. . . and the app developer who has supplied that app”. (Evans Trial Tr. 1596:22-25.) These “transactions take place between those two parties after the app has already been distributed.” (Evans Trial Tr. 1596:25-1597:1.) Both Apple and this Court have acknowledged that in-app purchasing “is almost completely driven by our developers, and the App Store does not participate in a meaningful way”. (PX-59.22; *see* Cook Trial Tr. 3990:20-23 (“[A]fter that first time, after that first interaction, the gamers are keeping the customer with the games, that is, the developers of games are keeping their customers. Apple is just profiting off that, it seems to me.”).)

375. But for Apple’s restrictions discussed above and below, developers of apps offering in-app purchases of digital goods could and would utilize alternative payment processing and related services from third parties, such as Stripe, Amazon Pay, Braintree, Paypal, and Square, or develop their own payment solutions using such services, just as

developers of iOS apps offering in-app purchases of physical goods do today and which developers currently use for purchases of digital goods made outside of the App Store. (Simon Trial Tr. 353:2-7; Fischer Trial Tr. 907:4-12, 19-21; Ex. Expert 1 (Evans) ¶¶ 235-236; Evans Trial Tr. 1600:5-13; *see* Section IV.257 above; *see also, e.g.*, DX-3905.3 (listing “[l]eading companies across the globe” that “trust Braintree with their payments”, including Airbnb, Uber, Dropbox, Yelp, and StubHub, among others).)

- a. In fact, on platforms other than iOS, many app stores without market power do not tie distribution services and payment solutions. For example, EGS and several Android app stores all allow developers to choose their own payment solutions.
(Ex. Expert 1 (Evans) ¶ 246.)

376. Apple has a 100% share of the iOS in-app payment processing solutions market. (Evans Trial Tr. 1661:6-8.)

377. Apple uses its monopoly power in iOS app distribution to coerce developers of iOS apps to use Apple’s payment solution, namely the IAP system, for all in-app transactions involving digital goods. (*See* PX-2619 (DPLA) § 3.3.3; PX-2790 (App Store Review Guidelines) § 3.1.1; Ex. Expert 1 (Evans) ¶¶ 286-287.)

378. Apple contractually ties together app distribution and payment solutions for in-app purchases of digital goods through the DPLA and App Store Review Guidelines, which condition distribution through the App Store on the use of Apple’s IAP. (PX-2619 (DPLA) § 3.3.3; PX-2790 (App Store Review Guidelines) § 3.1.1; *see also* Sweeney Trial Tr.

89:7-11 (“The two major disagreements were Apple’s policy prohibiting competing stores from existing on iOS, and Apple’s policy requiring that all payments for digital goods in iOS apps used in that purchase and paid to Apple at a 30-percent commission.”); *see* Section VI.D above.)

379. Apple introduced IAP and tied it to app distribution even though it had originally told developers that “when a developer wants to distribute their app for free, there is no charge for free apps at all”. (PX-880.21.) Around the time Apple made that presentation, and before the App Store launched, Apple employees knew that “many games have a healthy after-market in additional game levels, enhanced graphics for in-game activities, and other data up to and including completely new games that can be created from a[n] installed base game engine. Many for a fee. Some developers will want this for their iPhone apps.” (PX-897.2.)

380. IAP has since been very profitable. In fiscal year 2019 alone, Apple’s commission on in-app purchases accounted for [REDACTED]

[REDACTED] (See PX-2367.2; Cook Trial Tr. 3913:14-20 (agreeing that IAP “would be the . . . dominant way of purchasing” and “the dominant source of App Store revenue”).)

381. Apple enforces its tie vigorously and has removed thousands of apps from the App Store, or rejected their submission in the first place, because they did not use IAP. (See Section VI.B above.)

382. Contrary to its assurances to Congress that Apple “do[es] not retaliate or bully people” because it is “strongly against . . . company culture,” (PX-1725.31; Cook Trial Tr. 3921:6-21, 3925:12-14), Apple does in fact retaliate against developers who do not use, or threaten not to use, IAP. (Sweeney Trial Tr. 97:17-23 (“Apple has threatened to remove Epic’s

ability and access to its APIs to continue developing the *Unreal Engine* for iOS and Mac devices . . .”), 157:25-158:3 (“Apple also sent Epic a letter saying that they would remove our access to Apple platforms, . . . which would of course deprive us of the ability to develop software on that platform.”); PX-197.8 (“Do we want to take any punitive measures in response to the test (for example[], pulling all global featuring during the test period)? If so, how should those punitive measures be communicated to Netflix?”).)

- a. For example, in 2018, Netflix “ran a series of experiments to determine whether or not IAP was, in fact, increasing the number of subscribers it was obtaining in various geographies”.
(Ex. Depo. 3 at 154:7-12, 190:4-191:1 (Cue); PX-420.1; PX-421.1-2.)
- b. Netflix wanted to conduct this test because it understood that “IAP customers had much shorter subscription lives due to voluntary churn than non-IAP customers”. (Ex. Depo. 3 at 154:25-155:3, 155:5 (Cue).) In response to Netflix conducting this test, Apple took what it called “punitive measures”. (PX-197.8.)
- c. Apple “pull[ed] all marketing for [Netflix] in their test markets”, both “on Store and off Store”, because Apple “want[ed] them to feel the pain”. (PX-198.3.)

383. On August 13, 2020, after Epic activated its own Epic direct payment option within *Fortnite* on iOS, which Epic offered to users side by side with Apple’s IAP, Apple

threatened and ultimately did remove *Fortnite* from the App Store and indicated that it would take action against other Epic apps as well. (Sweeney Trial Tr. 148:18-149:7.)

VIII. APPLE'S CONDUCT CAUSES ANTI-COMPETITIVE EFFECTS IN THE MARKET FOR iOS IN-APP PAYMENT SOLUTIONS.

A. Apple's Conduct Raises the Price of In-App Purchases of Digital Goods Within iOS apps.

384. IAP is the mechanism by which Apple imposes and collects its 30% commission on in-app transactions between developers and their customers. (PX-2619.17 (DPLA) § 3.3.3; PX-2790.10 (App Store Review Guidelines) § 3.1.1.)

385. Apple is well aware that the 30% fee it charges for in-app purchases is far above market rates for comparable services. In December 2017, an Apple employee noted that through IAP “Apple creates a better experience for developers to engage users and offer promotions. It would have to be a LOT better to overcome the 30% hit however. It would also have to meet the need fulfilled by social media platforms for engagement, namely viral reach across friends. This is not something we’ve ever succeeded with . . .” (PX-257.1.)

386. For this very reason, Apple acknowledged that where IAP is “‘optional’ [that] means that no one will ever use it”. (PX-202.1.)

387. Because Apple charges for IAP a fee reflecting its market power, rather than market rates or the value Apple provides, and for the reasons discussed previously (*see* Part VII above), Apple’s tying of IAP to app distribution leads to higher prices for iOS in-app purchases of digital content.

388. For example, Down Dog charges 50% more for subscriptions purchased within its iOS app as compared to subscriptions purchased on a web browser “because of the 30 percent commission that Apple takes”. (Simon Trial Tr. 356:2-17.)

389. Because developers typically pass on these fees, consumers are harmed by IAP. (Evans Trial Tr. 1609:13-1610:6.)

B. Many Developers Cannot Afford to Pay Apple's 30% Commission for In-App Purchases of Digital Content.

390. Developers "have complained about the 30 percent commission for digital in-app purchases". (Fischer Trial Tr. 911:4-11 (agreeing that "developers [have] indicated to Apple their view that the 30 percent commission is too high"); *see also* Schiller Trial Tr. 3111:7-14.)

391. Developers have expressed concern that "the 30% cut using [Apple's] In App purchase . . . would mean [they are] losing money on every transaction"—except apparently for the "outliers" not required to use IAP. (PX-57.1; *see* Fischer Trial Tr. 835:22-836:11.)

392. When Apple attempted to impose the IAP requirement on iOS developers who sell physical goods and services, these providers informed Apple that they operate on "slim margins" and thus would "likely need to pass the 30% along to the consumer". (PX-422.1; *see also* Evans Trial Tr. 1609:13-22.)

393. Some small businesses cannot afford to absorb Apple's commission rates and cannot afford to pass the costs on to consumers without losing users. For example, Down Dog's Mr. Simon testified that when Down Dog ran pricing experiments, it generally "los[t] . . . the percentage of users equivalent to the increased subscription price". (Simon Trial Tr. 354:17-355:1 ("[W]e found that around our current pricing, if we increase the price by X percent, we get roughly an X percent decrease in subscribers").) Mr. Simon further testified that when Down Dog ran an experiment within its Android app in which it removed a link informing customers of

an option to subscribe online for roughly 33% cheaper, it observed a 28% reduction in the number of subscribers, either on the app or on the web, showing that Apple's policies, including its anti-steering restriction, cost Down Dog subscribers. (Simon Trial Tr. 365:3-367:5.)

394. Developers pass on the cost of Apple's commission to consumers (*See, e.g.*, PX-438.1 ("The problem is many can afford 30% but others will say they can't."); Simon Trial Tr. 354:11-16 ("At a high level, we have always discounted the website subscription by at least the 30 percent that Apple takes, passing on those savings to our customers.").)

C. By Standing as a Middleman in Every In-App Purchase of Digital Content, Apple Interferes with Developers' Ability to Provide Effective Customer Service.

395. In executing transactions through IAP, Apple uses the iOS user's Apple ID credentials and associated payment credentials the user gave to Apple when signing on to an Apple device. The developer, by contrast, cannot refund the purchase if the consumer requests a refund. (Ex. Depo. 12 at 126:6-11 (Gray).) As a result, the developer selling in-app digital content in an iOS app is not privy to the payment process, which is performed entirely by Apple on the basis of information to which the app developer has no access. (Simon Trial Tr. 367:14-368:24.)

396. Hence, if the transaction raises any issue such as a payment dispute, a request for a refund, etc., both the developer and the user must rely on Apple to communicate with the user and resolve the issue. (Sweeney Trial Tr. 91:24-92:7 ("Apple's required use of In-App Purchase reduces the quality of the support that we can provide to customers. Epic doesn't have the ability to issue refunds to customers, and so if a customer has a problem, we

can't service them directly. We have to refer them directly to Apple, to talk to Apple instead."); Simon Trial Tr. 368:20-369:2.)

397. Developers cannot initiate a refund to customers for App Store IAP purchases, and customers are required to contact Apple for a refund. (Sweeney Trial Tr. 91:24-92:7; Simon Trial Tr. 368:20-369:2.) Apple, in turn, "just provides [to the developer] the transaction ID and the fact that the transaction ID has been refunded" after the fact (Ex. Depo. 12 at 147:8-12 (Gray).) Even in the event the customer receives a refund, "Apple ha[s] the right to retain the commission" when it offers such refunds. (Ex. Depo. 12 at 134:20-22, 134:24-135:1 (Gray).) The DPLA still gives Apple this right today. (PX-2621.6, .8 (DPLA) §§ 3.8(c), 6.3.)

398. Developers are dissatisfied with the App Store's refund process. (Ex. Depo. 12 at 128:8-13, 128:15-25 (Gray); Simon Trial Tr. 372:9-373:3; PX-2062.1, .7 (reproducing a "selection of verbatim responses related to the App Store from the FY18 [developer] survey", including: "ALLOW DEVELOPERS TO ISSUE REFUNDS. This is beyond frustrating for us. Your awful policies make us look bad and it's painful to have to direct users to you"); *see also* PX-2365.) While Apple controls the payment solution for the transaction and all post-purchase interactions with the customer, Apple employees have acknowledged that "we have almost no insight into the complex IAP issues that customers present to us." (PX-2189.1) For example, Apple "cannot verify . . . claims" by customers that errors in apps render their in-app purchases obsolete, and "[a]s a result, AppleCare is forced to employ blanket rules for refunds" that "cause[] some customers to be treated unfairly while also allowing for fraudulent claims to be refunded". (PX-2189.1.)

399. When Epic has to tell its *Fortnite* users to “go to Apple to request a refund”, those users experience “confusion” and have “a poor experience”. (*See* Weissinger Trial Tr. 1302:22-1303:17 (discussing Apple interfering with Epic’s ability to provide customer support to *Fortnite* users).) Epic could avoid this issue if it were able to offer its own payment processor on iOS, like it does within the Epic Games Store. (Weissinger Trial Tr. 1303:13-17.)

400. Developers are best situated to deal with issues raised by their own customers with respect to issues arising within their own apps; Epic’s support team, for example, is best situated to explain what, if anything, has gone wrong with a purchase, how to use a newly-acquired tool, skin, or weapon, etc. Apple, by contrast, has only one decision to make—whether to refund or not the price of a purchase. (*See* PX-2189.1 (“[W]e have almost no insight into the complex IAP issues that customers present to us. As a result, AppleCare is forced to employ blanket rules for refunds.”).) In Epic’s own experience, the disconnect between customer service and transaction servicing, and between Epic and its own customers over in-app transactions, has led to confusion and complaints from customers, who contact Epic hoping to rectify disputes over payments—and blame Epic for sending them to Apple about a transaction users rightfully view as a transaction between them and Epic. (Sweeney Trial Tr. 128:18-129:4 (“When a customer contacts us for support, if we process that customer’s payment directly, we have far more knowledge about the details of the payment and far more control over issuing refunds or partial refunds or investigating anything that went wrong because we have that direct access to our payment service; whereas with Apple’s In-App Purchase system, we have no way

to help a customer if we need to refund them. We simply have to tell them to go talk to Apple.”).)

401. Match Group, for example, has noted that Apple’s IAP system interferes with its relationship with its iOS customers because “it’s extremely strange and abnormal for customers to have to reach out to the main company for all general customer inquiries, and then have to reach out to another company as it pertains to . . . their paid experience”. (Ex. Depo. 1 at 34:14-37:7 (Ong).) Match Group’s iOS customers contact Match with billing and refund issues that Match cannot handle and must refer to Apple. (Ex. Depo. 1 at 34:14-37:7, 48:4-10 (Ong).) Match has no visibility into Apple’s refund policy, and Apple, when it considers whether to offer a user a refund does not have the ability to assess whether and how a user accessed Match’s apps. (Ex. Depo. 1 at 48:17-19, 48:21-51:06, 162:03-22 (Ong).) Match Group is dissatisfied with this arrangement because it has led to Match’s customers having poor experiences with Match’s products and brands because of Apple’s conduct that is beyond Match’s ability to control. (Ex. Depo. 1 at 34:14-37:7, 167:1-4, 167:6-20 (Ong).)

402. Down Dog, for example, has experienced significant customer service issues as a result of being required to use Apple’s IAP. Because transactions on its native iOS app are processed by Apple, Down Dog “can’t issue refunds, or even cancel the subscriptions of users who subscribe via in-app purchases”. (Simon Trial Tr. 355:2-12.) Instead, Down Dog must direct its customers to Apple for issues related to subscriptions and billing because “only the Apple customer service team can issue them a refund if they purchased using in-app purchases.” (Simon Trial Tr. 368:20-369:2.) When it is able to manage its own customer

service experiences, Down Dog applies a lenient refund policy that ordinarily permits consumers to obtain refunds within a week of a monthly subscription payment or a month of an annual subscription payment. (Simon Trial Tr. 370:2-12.) By contrast, Apple generally does not issue refunds of iOS purchases unless they are requested within 24 hours of payment. (Simon Trial Tr. 370:13-371:3.) Because Down Dog must pass the cost of Apple’s 30% commission on to consumers, it frequently experiences complaints from customers who have paid more for an IAP subscription than they would have for a web subscription. (Simon Trial Tr. 371:18-372:14.) This causes customer service issues because Down Dog cannot remedy these customer service issues other than by directing the users to Apple. (Simon Trial Tr. 372:9-373:3.)

403. Developers have complained that “[t]he App Store takes parts of our job that we’re already extremely good at—like customer support, quick updates, easy refunds—and makes them all more stressful and difficult, in exchange for giving Apple 30% of our revenue”. (PX-744.2-3; *see also* Ex. Depo 1 at 162:3-22 (Ong); Simon Trial Tr. 355:2-12 (Apple’s prevention of developers from using their own payment processing creates a “substantial customer service issue” because developers “can’t remedy” customer complaints, “can’t issue refunds, or even cancel the subscriptions of users who subscribe via in-app purchases”); Ex. Depo. 2 at 136:15-138:3 (Shoemaker).)

D. Apple’s Management of IAP Refunds Increases Risk of Fraud.

404. Apple distinguishes in-app purchases of “consumables” from “non-consumables”. “Consumables” are digital items such as lives in a game or app-specific currency—items that are consumed by the user until they are depleted, at which point the user

can purchase them again. Non-consumable items, like “skins”, weapons, etc., or an upgrade to the premium version of an app, are purchased once and do not expire after the initial purchase. (PX-2790.10 (Guidelines) § 3.1.1; ; PX-2619.52 (DPLA) § 2.6.).)

405. Prior to the summer of 2020, when a consumer would request Apple for a refund for a non-consumable product, Apple did not provide a developer “access at that level of detail where they can remove the non-consumable” that was refunded. (Ex. Depo. 12 at 146:18-20, *id.* at 146:22-147:6 (Gray).) This attracted refund fraud, which occurs “when the customer buys and enjoys or resells the content and then requests a refund even though they have actually utilized it, therefore providing inaccurate information in their request for refund”. (Ex. Depo. 12 at 146:9-13 (Gray).) It is widely believed in the app industry that the most effective tool against refund fraud is the reversal of the purchase at issue; by contrast, the ability to obtain a refund and retain the non-consumable content incentivizes fraud by rewarding it. Once developers were given access to this “refund API”, Apple saw “improved refund rates” and lower amounts of fraud. (Ex. Depo. 12 at 150:15-18, 150:20-23, 150:25-151:05 (Gray).)

406. Apple’s efforts to combat payment fraud appear to have been unsuccessful. In 2016, Apple identified that only “45 to 55” percent of billings are from “trusted accounts”. (PX-2190.2; Fischer Trial Tr. 897:14-18.)

E. Apple Does Not Provide Developers Access to Key Analytics About Their Customers, Which They Could Use to Improve Their Offerings.

407. Apple’s IAP payment solution provides limited reporting on customer transactions.

- a. The reporting features do not provide detailed data on payments transactions, including all of the data elements carried in the authorization and settlement messages. Developers, for example, are unable to reconcile their transactions and revenue from the reporting provided by Apple. (*See* PX-0864.2 (“We need to ensure we have a way to reconcile the transactions we see [on] our end and payments you make to us As discussed, our figures from Apple for just our Tinder business can be off as much as ~\$1M at any time during the year which is a concern . . . ”).)
- b. When Epic has requested that Apple provide additional detail on payment processing for example, fraud behavior and patterns or authorization rates broken down by country and payment method—Apple did not respond. (PX-2362.3.)

408. As a result of having to use IAP, Epic has also been prevented from forming a direct link between the customer ID in its system and the customer ID in Apple’s system. (Sweeney Trial Tr. 128:18-129:4 (“[I]f we process [a] customer’s payment directly, we have far more knowledge about the details of the payment.”).)

- a. Epic cannot readily identify the customers of its apps in the IAP payment transaction details. (Sweeney Trial Tr. 128:18-129:4.) This lack of information harms Epic’s ability to provide better service to customers on the basis of payments activity, as it is able

to do in payment services with other payment processors.

(Sweeney Trial Tr. 128:18-129:4.)

- b. Other payment processors that Epic works with, such as Braintree, provide a complete database of transactions and customer information that allows Epic to track customer data.
(PX-2451.3-6.)
- c. This information would allow Epic to obtain real-time reporting about its customers' spending behavior and identify potential areas of improvement in its offerings. (PX-2451.3-6.)

409. The ability to identify the transacting user could allow developers to better identify their users, which could be important for developers for a host of reasons—from better marketing to better safety protocols.

410. For example, on platforms where Match Group has the ability to process customer payments directly, it uses customer billing information to run registered sex offender checks, so as to improve the safety of its service. (Ex. Depo. 1 at 34:14-23, 36:24-37:7, 47:15-48:1, 169:24-170:8, 170:10-19 (Ong).)

411. Match Group has asked Apple to share user billing data to permit Match Group to conduct sex offender and age verification screening, but Apple has not permitted Match Group to access this billing data. (Ex. Depo. 1 at 171:14-172:16, 172:18-173:6 (Ong).)

F. Apple's Price Tiers Interfere with Developers' Pricing in Foreign Markets.

412. "Since 2010, the price for in-app purchases must either be free or . . . some number with .99 at the end". (Ex. Depo. 9 at 266:12-15 (Fischer).)

413. "[A]t least since 2010, [Apple has] been asked from time to time by developers to have more flexibility to charge different prices for in-app purchases", but "to date the answer has been no". (Ex. Depo. 9 at 266:16-24 (Fischer).)

414. To use IAP for purchases, developers must submit the items they are going to sell using a template provided by Apple and select prices for each product from a list of "price tiers" provided by Apple. (Ex. Depo. 12 at 195:15-196:14, 206:13-24 (Gray).) Each tier includes a fixed price for every international currency supported by Apple. (PX-2202.2) Apple can and does change the foreign currency prices in each price tier from time to time, at Apple's discretion and without input or choice from developers. (Ex. Depo. 12 at 206:13-24 (Gray).)

a. Because each foreign price tier must have a corresponding U.S. price tier, developers are prevented from pricing their in-app purchases flexibly to take account of local demand and local preferences. (PX-2202.2; Ex. Depo. 12 at 195:15-23, 206:13-24 (Gray).)

415. The price points prescribed by IAP are expressed in U.S. dollars to developers, and Apple then determines the final price for local markets in local currency. (Ex. Depo. 12 at 208:6-9 (Gray).)

G. By Requiring Apple's In-App Payment Solution, Apple Deprives Consumers of Innovative Payment Options that Would Offer More Flexibility and Convenience.

416. Absent Apple's restrictions, developers could offer customers new and innovative payment options for their in-app purchases of digital goods. (Evans Trial Tr. 1599:20-1600:13.)

417. [REDACTED]

[REDACTED]

[REDACTED]

418. Apple's IAP requirement also prevents consumers from enjoying the benefits of multi-platform payment processors, which also increases users' mixing-and-matching costs. (Ex. Expert 4 (Athey) ¶¶ 77-78.)

a. Such multi-platform payment processors would offer customers a more seamless experience across platforms, including the recognition of user purchases across multiple platforms, the ability to set and store payment preferences and other account settings, and a more consistent customer support experience. (Athey Trial Tr. 1783:22-25, 1784:5-8; Ex. Expert 4 (Athey) ¶¶ 77-78.)

H. Through Its Anti-Steering Provisions, Apple Deprives Consumers of Knowledge Regarding Available Choices.

419. Match Group has asked for Apple's permission to send emails or push notifications to users steering them to its website, where they can pay lower prices, and Apple has refused. (Ex. Depo 1 at 24:23-25:5, 158:4-159:14 (Ong).) Thus, while there is no rule

preventing developers from offering content at a discount outside of their iOS apps, developers are barred from informing consumers of such discounts from within their apps or using email addresses provided by their users through the app. (Lafontaine Trial Tr. 2056:13-20 (agreeing that “Apple does not allow developers to tell users in the app that they have” priced differently on other platforms, and “Apple does not allow targeted communications like email to inform people of that either”); *see also* Schmalensee Trial Tr. 1911:1-12.)

- a. Dr. Evans described the issue: “[T]he problem here is . . . requiring Epic to use the IAP in the iOS *Fortnite* app, in combination with also putting a whole set of barriers that doesn’t make it impossible, but that makes **it much more difficult for Epic to communicate to the iOS app user that they have another alternative to go to.**” (Evans Trial Tr. 1715:11-16) (emphasis added). Apple’s “anti-steering provisions . . . are preventing a way to bypass . . . a tie” that requires developers to use Apple’s IAP API. (Evans Trial Tr. 1726:16-18.) “[A]t a 30-percent commission, developers have an incentive to direct consumers . . . not to purchase on . . . the App Store”. But Apple’s “anti-steering restrictions . . . prevent the developer from informing the consumer that there is another alternative available to them.” (Evans Trial Tr. 2408:20-2409:5.)

- b. While other platforms also have anti-steering provisions, an important distinction is that these platforms do not have market power. (Evans Trial Tr. 2432:18-2433:19.) As Dr. Evans explained, a firm with market power—such as Apple—might impose anti-steering rules “to prevent customers from . . . seeking . . . other alternatives.” (Evans Trial Tr. 2436:5-6.)
- c. Although Dr. Schmalensee tried to analogize Apple’s anti-steering provision to American Express’s (Schmalensee Trial Tr. 1890:16-1891:12, 1992:19-1993:13), the Court pointed out that “when you go into a store, you can see the sign that says, [‘]Visa, Mastercard, Discover,[]AmEx’ . . . Those visual indications of options don’t exist [on iOS].” (Schmalensee Trial Tr. 1891:13-15, 1891:17-19.) Dr. Evans explained that the American Express situation is “much more narrow”, as it involved a situation where a consumer was about to use her American Express card but was encouraged not to by a merchant who had held itself out as accepting payment from American Express. (Evans Trial Tr. 2403:19-2404:5.)

420. Contrary to Apple’s repeated arguments that the anti-steering provisions only apply right after a developer signs up a new user (*e.g.*, Schiller Trial Tr. 2823:16-20) there is no such limitation in the rule itself. (*See* PX-2790.10 (App Store Review Guidelines) § 3.1.1.)

421. While Apple contends that developers just need to obtain the user's email from Apple (Cook Trial Tr. 3864:12-16) such information is not readily available, given Apple's Sign in with Apple feature, which "must also [be] offer[ed]" for "all apps that want to offer any other third-party log-in option . . ." (Schmid Trial Tr. 3267: 21-24.) Through Sign in With Apple, a "user can hide their email from the third-party developer". (Schmid Trial Tr. 3267:1-3.)

I. Apple's Pro-Competitive Justifications for Its Anti-Steering Provision Fail.

422. According to Apple, the "key idea" with the anti-steering provision is preventing developers from targeting users who are being acquired from the App Store. (Schiller Trial Tr. 2823:13-15.) According to Mr. Schiller, Apple's concern is "just the targeting of the brand-new user that we helped them get." (Schiller Trial Tr. 2826:6-7.) Yet as developers such as Epic and Match Group have testified, Apple is doing little to help acquire these users; instead, it is the developers' products that bring users into the App Store in the first place. (Ex. Depo. 1 at 58:20-59:13, 152:4-152:23 (Ong); *see also* Weissinger Trial Tr. 1314:11-22.) And as the Court observed, after the "first interaction, the gamers are keeping the customer with the games", and "Apple is just profiting off that". (Cook Trial Tr. 3990:12-25.)

IX. EPIC IS INJURED BY APPLE'S CONDUCT.

A. Background

423. Epic has been—and continues to be—seriously harmed by Apple's conduct. (Sweeney Trial Tr. 91:20-92:22 (“Apple's required use of In-App Purchase reduces the quality of the support that we can provide to customers. Epic doesn't have the ability to issue refunds to customers, and so if a customer has a problem, we can't service them directly. We have to refer them directly to Apple, to talk to Apple instead. . . . And Apple has also imposed a myriad of policies on individual features of our products, which have restricted them from achieving the sort of vision that we originally had for them, and in some cases prevented us from doing things which we did on other platforms with great success that were loved by customers. Apple's policies had, in many ways, prevented us from implementing the sorts of features that we wanted in Fortnite that we had been able to implement on other platforms.”), *id.* at 97:24-98:4 (explaining the harm to the Epic Games Store.); Allison Trial Tr. 1234:4-8 (“Mobile devices have billions of players at the end of the screen. It's an incredibly large total addressable market. We are [a]company that is aggressive in going after growth sectors. We are not able to go after that addressable market with the growth plan.”).)

424. Tim Sweeney founded the company that eventually became Epic in 1991. (Sweeney Trial Tr. 89:19.)

425. Epic is headquartered in Cary, North Carolina and has more than 3,200 employees in offices around the world. (Sweeney Trial Tr. 112:18-113:14.)

426. What started as a game company has evolved into much more. Epic now has a number of different lines of business. It is a distributor, publisher and developer of game and non-game apps. (Sweeney Trial Tr. 93:22-94:9 (“Epic is in a variety of businesses all tied to the common theme of building and supporting real-time 3D content, both through consumer products and to developers, and . . . other services that socially connect users together.”).)

427. Epic also makes and distributes tools used by developers for a wide variety of graphic applications in many different industries. (Sweeney Trial Tr. 116:18-22 (“The Unreal Engine is a development tool aimed at 3D content creators rather than consumers. It contains content creation tools, real-time 3D graphics, capabilities, and real-time physics and simulation technology that is used by a wide variety of industries to make a variety of 3D content.”).) And Epic provides the Unreal Marketplace, a store for pre-created two-dimensional and three-dimensional assets for purchase by Unreal developers. (Ko Trial Tr. 799:18-21.)

- a. Epic develops and distributes on iOS apps that work in conjunction with *Unreal Engine*, including *Unreal Remote* and *Live Link Face*. (Grant Trial Tr. 664:21-665:17.) These apps “provide[] a means for people who work in the movie or TV industry to capture performances and view them on *Unreal Engine*”. (Grant Trial Tr. 664:24-665:3.) They do not include competitive game play. (See Sweeney Trial Tr. 304:25-305:2 (noting there is no competitive gameplay associated with *Unreal Engine*).)

428. Epic is a would-be competitor of Apple in the distribution of apps. (Sweeney Trial Tr. 95:16-20; *see also* Allison Trial Tr. 1233:8-17 (explaining that Epic has not launched the Epic Games Store on iOS due to Apple's current policies).)

429. Epic runs the Epic Games Store ("EGS"), an app store available on PCs and Mac computers. (Sweeney Trial Tr. 94:7-9 ("And we also operate a digital store that connects developers with PC and Mac games to consumers on the PC and Mac platform called the Epic Games Store."); Allison Trial Tr. 1198:19-20 ("The Epic Games Store is a digital distribution platform for games and apps for PC and Mac.").)

430. EGS carries hundreds of games, such as Epic's *Fortnite* and many third-party titles. (Sweeney Trial Tr. 261:24-25; *see also* Allison Trial Tr. 1210:20-23.) It also carries non-game apps, such as the Spotify music app, the Brave web browser, the KenShape creation tool for artists and Itch.io, a third-party store. (Sweeney Trial Tr. 124:22-125:8; Allison Trial Tr. 1199:13-14.) Since its inception, EGS hosted *Unreal Engine* and Epic had plans to include different types of apps. (Sweeney Trial Tr. 123:15-124:5, 262:19-24; Allison Trial Tr. 1199:15-1200:1 ("Q. When did Epic first start having conversations around offering nongame apps on the store? A. We announced the store in December of 2018. Pretty quickly, after the announcement, we had a bunch of inbound for both gaming and nongaming app companies wanting to know more about the store and how they could bring their products to market with us. Q. Could you identify any nongaming app companies that reached out at that time? A. We spoke with Twitch. We spoke with Discord. We spoke with a lot of smaller game development or game adjacent companies as well.").)

431. Epic is not aware of any security issues that EGS has introduced onto any Mac devices on which EGS has been downloaded. (Sweeney Trial Tr. 122:12-19; Allison Trial Tr. 1228:3-5 (“Q. Have there ever been any known instances of malware on the Epic Games Store? A. Not to my knowledge.”).)

432. Absent the restrictions imposed by Apple, Epic would operate a mobile version of the Epic Games Store on iOS that would compete with the Apple App Store. (Sweeney Trial Tr. 97:24-98:4 (“[O]ur Epic Games Store business is harmed by Apple’s policies because we are barred from introducing a version of our store for iOS. So we can operate on PC and Mac, but we cannot, because of Apple’s policies, distribute apps on iOS, and that locks us out of a very large worldwide business we would love to be in.”); *see also* Allison Trial Tr. 1233:8-17 (explaining that Epic has not launched the Epic Games Store on iOS due to Apple’s current policies).)

433. Epic and Apple also compete as developers. (Sweeney Trial Tr. 95:3-15.)

- a. Epic develops a variety of apps, including *Fortnite* and games such as *Rocket League* and *Fall Guys*. (Sweeney Trial Tr. 116:8-10 (“[W]e have several games that we’re actively developing, including *Rocket League*, a game about cars playing soccer; and *Fall Guys*, which is a virtual 3D game show.”).)
- b. Epic also develops the social media app *Houseparty*. *Houseparty* is available to download on the App Store. (Sweeney Trial Tr. 116:10-12 (“[W]e make *Houseparty*, which is a social video

application, sort of like a version of Zoom that's for friends.”), *id.* at 117:8-12, 305:14-21.)

- c. Apple operates Apple Arcade, “a subscription game service, which to some extent competes with Epic’s products”. (Sweeney Trial Tr. 95:11-12; Fischer Trial Tr. 900:24-901:14.)
- d. Apple “provides SDKs of various sorts, such as [S]ign in with Apple, which to some extent competes with Epic’s account system”. (Sweeney Trial Tr. 95:13-15.)
- e. Apple also operates the Mac App Store, which competes to some extent with the Epic Games Store. (Sweeney Trial Tr. 95:23-96:1 (“[T]he Epic Games Store is, to some extent, in competition with the Mac App Store in that we both sell products to the same game users.”).)
- f. Apple develops its own apps in competition with Epic and other third-party apps. (Ex. Expert 1 (Evans) ¶ 209.)

434. As a software developer, Epic develops tools that it licenses to third parties. (Sweeney Trial Tr. 94:5-7 (Epic’s businesses include software development “directed at developers which enable[s] them to develop their own apps or games, such as *Unreal Engine* and Epic Online Services”), *id.* at 229:3-5 (“[Epic’s] tools are used in . . . helping those with third-party games . . .”); Grant Trial Tr. 662:8-11 (“We develop software libraries that developers can incorporate into their applications to provide additional functionality. Epic Online Services

would be the best example of that.”), *id.* at 667:3-7 (Epic has “end user license agreements that a developer would agree to when they download *Unreal Engine*”), *id.* at 667:8-11 (“Epic is able to obtain compensation in connection with the distribution of apps made using the *Unreal Engine*.”).)

- a. Epic develops and distributes the *Unreal Engine*, a software suite that allows developers to create three-dimensional and immersive digital content. (Sweeney Trial Tr. 116:18-22 (“The *Unreal Engine* is a development tool aimed at 3D content creators rather than consumers. It contains content creation tools, real-time 3D graphics, capabilities, and real-time physics and simulation technology that is used by a wide variety of industries to make a variety of 3D content.”).)

435. Developers typically release apps on a global basis. Epic, for example, has distributed the mobile versions of its apps—for both Android and iOS—in any country around the world which can connect to the Epic website. (See Sweeney Trial Tr. 129:5-16.)

- a. Epic’s distribution for *Fortnite*, its other apps (for instance, *Houseparty*), and *Unreal Engine*, is generally worldwide. (Sweeney Trial Tr. 129:14-20.)

436. Epic also offers third-party developers a suite of back-end online gaming services through Epic Online Services (“EOS”). (Sweeney Trial Tr. 120:7-8 (“Epic Online Services is a software development kit that we make available to other game developers . . . ”).)

- a. These services include matchmaking, Epic's friends system, voice system and others. (Sweeney Trial Tr. 120:7-14 ("Epic Online Services . . . provides many of the social features that we built for *Fortnite* and makes them available to other companies, such as Epic's account system, Epic's matchmaking system, to put players together into a shared game session. It includes Epic's friends system. And we're soon to release the Epic Games voice system for voice chat.").)
- b. Epic Online Services are "available everywhere in the world that is not subject to certain U.S. export restrictions". (Sweeney Trial Tr. 129:23-130:2.)

B. *Fortnite.*

437. *Fortnite* is Epic's most popular app. (Sweeney Trial Tr. 99:5-6.)
 - a. *Fortnite* has had more than 400 hundred million registered users worldwide. (Sweeney Trial Tr. 100:5-7.)
438. *Fortnite* is a social entertainment experience that includes a variety of gaming experiences and nongaming experiences within it. (Sweeney Trial Tr. 98:6-8.)
439. Since its initial launch in 2017, *Fortnite* has evolved into more than a game. (Sweeney Trial Tr. 98:6-8 ("*Fortnite* is a phenomena that transcends gaming. It's a social entertainment experience. It includes a variety of gaming experiences and also nongaming experiences within it."); Weissinger Trial Tr. 1296:11 (*Fortnite* is "more than a game").)

- a. In addition to gameplay, *Fortnite* enables users to watch movies or TV shows, attend concerts and participate in global cultural events within the app itself. (Sweeney Trial Tr. 98:12-99:3.)
- b. The development of this array of functionality is a stepping stone towards the creation of a *Fortnite*-based “metaverse”. (Sweeney Trial Tr. 99:11-100:4 (“In the metaverse, and in experiences like *Fortnite*, participants . . . can go together and have a purely social experience, watch a concert or just hang out and chat.”).)
- c. A metaverse is a virtual world in which a user can experience many different things—consume content, transact, interact with friends and family, as well as play. (Sweeney Trial Tr. 99:17-22; Weissinger Trial Tr. 1295:10-11 (describing a metaverse as a “social place where people can experience events together and hang out together”); Kosmynka Trial Tr. 1127:18-23 (“So my understanding of the Metaverse is a . . . virtual world where you go with your particular character and are with players that you know, players you may not know, and you navigate around that Metaverse, which could include additional worlds in various experiences.”).)
- d. Gameplay need not be a part of a user’s metaverse experience. (Sweeney Trial Tr. 99:23-25.)

440. *Fortnite* is free to download and use. (Sweeney Trial Tr. 108:14-16.)

- a. Users have the opportunity (but not the requirement) to purchase digital content within the app—referred to as “in-app purchases”. (Sweeney Trial Tr. 108:18-20 (“Epic sells cosmetics within the game[,] which players can optionally purchase to enhance their appearance in the world of *Fortnite*.”), 109:19 (“Epic sells many outfits through in-app purchase.”).)

441. In-app purchases do not buy game play advantages in *Fortnite*’s most popular game mode, *Battle Royale*. (Sweeney Trial Tr. 110:5-10 (“One of the key principles of *Fortnite Battle Royale* is you can never gain an advantage over another human by purchasing any sort of item in the game. All players participate on a level-playing field, and the money they spend only determines how they appear or what dances they can do, not how fast they can run.”).)

- a. Users can make in-app purchases of different items that function as forms of self-expression. These include cosmetic enhancements, or “skins” (*i.e.*, in-game costumes), dance moves known as “emotes” and more. (Sweeney Trial Tr. 108:23-109:3 (“A cosmetic item is an item that changes your avatar’s appearance in the world, such as an outfit. . . . *Fortnite* cosmetics also include emotes such as dances, or gestures that you can make your animated character in the world, and other . . . fashion

accessories.”); *see Weissinger Trial Tr. 1299:6-8 (“Fortnite sells digital items, primarily . . . cosmetics.”).*

442. In *Fortnite’s Battle Royale* and *Creative* modes, there are two categories of in-app purchases: (1) purchases of V-Bucks, *Fortnite’s* in-app currency that can be redeemed for in-game content, such as each new season’s “Battle Pass” (a feature that provides access to challenges and unlockable content) or cosmetic upgrades (Sweeney Trial Tr. 108:17-109:3, 188:13-189:11), and (2) direct purchases of *Fortnite* content (Weissinger Trial Tr. 1300:3-7 (“[W]e have these things called Real Money Transactions . . . that you purchase for a real dollar amount inside of the game.”)).

- a. “[N]early half of the players coming into [Fortnite] on a daily basis”—around 15 million users—“are playing Creative and Party Royale Modes”. (Weissinger Trial Tr. 1296:5-8.)
- b. Epic also offers access to *Fortnite’s Save the World* game mode. (Weissinger Trial Tr. 1354:23-24.) *Save the World* is not—and was never—available on iOS. (Weissinger Trial Tr. 1354:14-18.)

443. As of December 2020, players can subscribe to *Fortnite* Crew, which provides users with the Battle Pass for each new Battle Royale season, a monthly allotment of 1,000 V-Bucks and exclusive cosmetics. (Weissinger Trial Tr. 1301:15-21 (“[I]n December of 2020, we launched Fortnite [Crew], which is a subscription offering, and in that subscription offering, you pay \$12 a month, and you receive a thousand V-Bucks each month. You receive . . .

. an exclusive cosmetic pack, and you receive the Battle Pass as well, in addition to some other stuff that we throw in every month.”).)

444. Without being able to sell in-app content, Epic would have no viable way of monetizing *Fortnite*. (Weissinger Trial Tr. 1303:18-1306:7 (explaining why “[i]t would be devastating” if Epic “could not offer in-app purchases within *Fortnite*”: “[T]he *Fortnite* game client itself is the best way to actually present and show what you are purchasing. . . . [T]his is the kind of ‘try before you buy.’ . . . [T]he way I would describe it is the difference is almost going to Macy’s and actually putting on an outfit and getting in front of a mirror and being able to turn around and look at it and go, ‘Oh, this looks nice’ versus trying to purchase something through like a mail-order catalog and just seeing the single static image and kind of being like, ‘Well, I hope it works’ or ‘I hope it fits.’”).)

445. Alternative methods of monetization, such as those used by some other games, would fundamentally change the *Fortnite* experience. (Weissinger Trial Tr. 1305:22-1306:7 (“Philosophically we just would never [offer paid in-app advertising]. Ads are a terrible experience. . . .”).)

a. *Fortnite*’s success depends on its being available to a large number of users, many of whom play the game entirely for free. A pay-to-download model would deter many of these users from downloading the app and make *Fortnite* less attractive to users who spend money in the app and require a large population of players to enjoy the game. (Sweeney Trial Tr. 188:2-3 (“I attribute

a lot of our success to our early decision to make *Fortnite Battle Royale* available for free.”); Weissinger Trial Tr. 1298:20-24 (“We want as many people to be able to [engage with *Fortnite*]. There should just be no [price] barrier to those connections and those experiences”).)

- b. Buying V-Bucks through the Epic website is not an attractive options for consumers. (Sweeney Trial Tr. 334:21-335:9 (“The time that people want to buy V-Bucks in *Fortnite* is when they see a new cool item in the *Fortnite* outfit shop. And at that point in time they are in *Fortnite* on some platform. And to set *Fortnite* aside, and pull out some device, go to the website, log in, and then make a transaction there is extremely inconvenient, versus a few taps on the screen using in-app purchase. So generally we . . . appreciate that there is a huge amount of payment processing and customer friction associated with selling a user of an app an item outside of that app.”); Weissinger Trial Tr. 1305:2-21 (“If suddenly you then have to leave that experience, you’re totally breaking the immersion of it. . . . It’s just like a totally disjointed experience, and it’s like absolutely, absolutely everything that we don’t want people to do. We don’t want you to leave the game when you’re trying to make a purchase.”); *see also* Cook Trial Tr.

3912:4-6 (agreeing that “it’s a negative user experience . . . if they have to leave the app” to make a purchase), *id.* at 3914:5 (acknowledging that “[i]t takes another click to leave the app”), *id.* at 3987:9-13 (noting that “[t]he majority of the revenue on the App Store comes from [in-app purchases within] games”).)

- c. If Epic relied on in-game advertising to monetize *Fortnite*, the user experience would be greatly diminished, and many users would be deterred from playing the game. (Weissinger Trial Tr. 1305:22-1306:7 (“The ad[-]free experience is superior.”).)

446. Epic has developed and distributed versions of *Fortnite* for Microsoft Windows, macOS, Nintendo Switch, PlayStation consoles, Xbox consoles, iOS and Android. (Sweeney Trial Tr. 133:5-11.)

447. A beta version of *Fortnite* was released on iOS in March 2018 ahead of the full release in April 2018. (Sweeney Trial Tr. 111:10-12; Grant Trial Tr. 741:2.) A version of *Fortnite* for the Android mobile operating system was first released in August 2018. (Ko Trial Tr. 798:15-16.)

448. *Fortnite* added 32 million new players in the second quarter of 2020 alone, the highest quarterly addition of new players since the third quarter of 2018. (PX-2455.3.) Although *Fortnite*’s monthly and daily active users have fluctuated over time, *Fortnite* remains hugely popular. (See PX-2456.1; PX-2463.8; Sweeney Trial Tr. 101:4-9 (“*Fortnite* was generally growing” between January 2020 and August 2020).)

449. Epic promotes in-app purchases in *Fortnite* through a number of channels. (See Weissinger Trial Tr. 1306:19-1308:19 (describing the various ways in which Epic markets *Fortnite*, including how it markets in-app purchases, specifically); 1310:6-25 (describing the in-app messaging tools Epic uses to promote in-app purchases); 1311:7-1312:1 (describing the out-of-app marketing Epic does to promote *Fortnite*).)

- a. *First*, Epic runs a “Message of the Day” that appears in the game when players first log in and alerts them to new items in the *Fortnite* item shop that day. (Weissinger Trial Tr. 1310:10-14.)
- b. *Second*, Epic has “over a hundred million” followers of its accounts across different social media platforms. (Weissinger Trial Tr. 1312:6-9.) Epic has accounts on Twitch, Instagram, Twitter, YouTube and Facebook, and Epic uses these channels to market *Fortnite*. (Weissinger Trial Tr. 1311:7-9, 15-18; PX-2463.1; DX-3399.4.)
- c. *Third*, Epic partners with popular brands, such as Disney, Star Wars, Marvel and others, to create new, cool in-game content available for purchase. (Weissinger Trial Tr. 1307:23-1308:6; PX-2783 (video showing a Star Wars-related promotion).)

450. Epic, which spends over \$300 million each year and has spent over \$1 billion in total marketing *Fortnite* (Weissinger Trial Tr. 1314:5-10), has been responsible for the vast majority of promotional activity that drives in-app *Fortnite* purchases across its many

platforms (Weissinger Trial Tr. 1314:11-23 (noting that Epic drove “*Fortnite*’s financial success”)).)

451. When *Fortnite* was released on iOS in 2018, it was “a cultural phenomenon”. (Weissinger Trial Tr. 1337:16-21.)

452. When *Fortnite* was available on iOS, Apple often requested to use *Fortnite* to promote “another part of [Apple’s] business”. (Weissinger Trial Tr. 1340:5-8.)

453. Being featured in the App Store or through Apple’s social media channels had limited marketing value for Epic. (Weissinger Trial Tr. 1340:25-1341:19 (comparing featuring on the App Store to featuring on the consoles’ stores), *id.* at 1340:11-24 (explaining why Apple’s social media promotions did not benefit *Fortnite*); *see also* PX-634.2 (Apple’s “tear sheet” business snapshot for Epic showed that 69% of *Fortnite* downloads in the studied period were a result of users searching for *Fortnite* in the App Store rather than a result of Apple’s featuring); Schmid Trial Tr. 3329:7-3330:19 (explaining the “tear sheet”).)

454. Apple’s marketing team created numerous problems for Epic. For example, “[i]n multiple instances, Apple actually leaked [Epic’s] promotional content [for *Fortnite*] ahead of [Epic’s] promotional” schedule. (Weissinger Trial Tr. 1342:10-15.)

- a. In December 2018, Apple leaked a *Fortnite* skin a day before it was supposed to be released to the public. (Weissinger Trial Tr. 1342:17-21 (“Apple leaked the Battle Pass key art content, so all the characters that were coming with the new season leaked in advance of the official *Fortnite* reveal.”).)

- b. In February 2019, Epic hosted its first virtual concert in *Fortnite*, which featured DJ Marshmello. (Sweeney Trial Tr. 101:24; 324:2-4.) Several weeks prior to the concert, Apple asked Epic if it could use the event as an opportunity to market Apple Music. (Weissinger Trial Tr. 1342:23-24.) As Epic's head of marketing noted, Apple's marketing support "always felt . . . opportunistic". (Weissinger Trial Tr. 1338:6, 1339:2-12.) Apple then leaked the DJ Marshmello set list prior to the event going live in *Fortnite*. (Weissinger Trial Tr. 1342:22-1343:1.) An internal Apple App Store presentation recognized the reach of the concert, noting that "10M people watched the Marshmello concert live in-game, and that doesn't even include viewers on Twitch, YouTube and other platforms". (DX-4094.26.)
- c. In October 2019, Mike Schmid, Apple's business development manager responsible for *Fortnite*, reached out to Mark Rein, Epic's Vice President, requesting assets in advance to support a promotion for *Fortnite*'s upcoming launch of Chapter 2, the largest update to the game since its original launch. (PX-2435.1.) Because Epic was planning a surprise release of Chapter 2, Schmid repeatedly assured Epic that he would take "personal responsibility" for ensuring that Apple did not leak details of the

launch. (PX-2435.2.) He recognized that Apple “had issues in the past with a significant [*Fortnite*] art leak”, but he promised he would “limit the exposure to the absolute minimum amount of folks needed to cut and prepare [the assets] for launch”. (PX-2435.2.) Despite these assurances, Apple leaked *Fortnite* Chapter 2 artwork ahead of the planned launch, spoiling the surprise for *Fortnite* players on all platforms. (Weissinger Trial Tr. 1343:2-18; *see also* PX-2273.1-4.)

- d. Monetarily, having *Fortnite* on the App Store has been a boon for Apple. Mr. Schmid testified that although he believed that Apple had spent close to \$1 million marketing *Fortnite* in the last 11 months that *Fortnite* was on the App Store, he admitted that Apple had earned “[o]ver \$100 million” on *Fortnite* commissions during the two-and-a-half years that *Fortnite* was on the App Store. (Schmid Trial Tr. 3310:18-3311:7.) Mr. Schmid was unwilling to state whether Apple had earned more than that from *Fortnite* (Schmid Trial Tr. 3311:15-20), [REDACTED]
[REDACTED]
[REDACTED]. (DX-4322.)

455. A key feature of *Fortnite* is being an in-game universe that constantly evolves. Epic releases new content and updates, including major changes to the map and

gameplay, on a weekly basis. These updates ensure that users can enjoy new and surprising in-game experiences each time they open the app. Having a purely static environment without these updates would materially degrade the user experience. (Sweeney Trial Tr. 105:21-106:2 (“*Fortnite* evolves through a series of seasons, and several seasons have ended in major cinematic events.”), *id.* at 106:6-7 (“We generally make a major update to *Fortnite* every two weeks.”), *id.* at 106:10-14 (“[T]he world of *Fortnite* is constantly evolving. There are new faces appearing in the world, new forms of game play and other behavior constantly coming in every time. And these updates are critical for Epic to deliver all this new functionality to . . . *Fortnite* participants.”).)

456. Another feature of *Fortnite* is cross-play. Cross-play is the ability to play with users on different platforms located anywhere in the world. (Sweeney Trial Tr. 106:18-22, 196:8-22.)

- a. Since September 2018, cross-platform play for *Fortnite* has been available on Sony’s PlayStation, Microsoft’s Xbox, the Nintendo Switch, Windows PCs, Mac computers, certain Android and (until recently) certain iOS mobile devices. (Sweeney Trial Tr. 107:2-10 (noting that “every *Fortnite* player on all seven different platforms was able to play together in that time frame”), *id.* at 237:15-18.)
- b. Epic pioneered cross-platform play for the gaming industry. It persuaded Sony and Microsoft to erase the artificial barriers between players on their console platforms, making *Fortnite* the

first game to achieve full cross-play functionality across those devices, as well as PCs and mobile devices. (Sweeney Trial Tr. 106:25-107:10 (“Epic went through a series of negotiations with Microsoft and with Sony over the period of 2018 -- throughout 2018, which resulted in both Microsoft and Sony opening up to enable cross-play between their consoles and between every other platform, with the effect that every *Fortnite* player on all seven different platforms was able to play together in that time frame.”), *id.* at 198:22-199:6.)

457. For *Fortnite* users to play together online, they must have the same “version” of *Fortnite* software. (Sweeney Trial Tr. 158:17-19 (“All *Fortnite* users in a session need to be on the same version of *Fortnite* so they have the latest version of the *Fortnite* world and the latest content.”).)

458. Apple delisted *Fortnite* from the App Store on August 13, 2020. (Sweeney Trial Tr. 148:17-22.)

- a. When Apple delisted *Fortnite*, it prevented Epic from further updating the iOS version of the game. (Grant Trial Tr. 737:23-25 (“If you had not updated *Fortnite* by the 13th because it was no [longer] in the App Store, you could not get an update. . . .”).)
- b. This cut off iOS users from being able to play with users on other platforms once Epic released its next content update. (Sweeney

Trial Tr. 158:19-23 (“And so when Apple removed *Fortnite*’s ability to update *Fortnite*, and Epic had issued the next season launch for *Fortnite*, all the players on other platforms could get the latest version and moved on while the iOS players were left behind on the old version.”); Grant Trial Tr. 738:1-6 (“The larger impact was approximately two weeks later when we released *Fortnite* season 14. At that point, because Apple [was] blocking updates, we submitted version 14 and they declined to take it. It meant that users on iOS were no longer able to play with other platforms, and did not have access to the Season 14 con[t]ent or *Fortnite* experiences.”); *see also* Weissinger Trial Tr. 1347:19-1348:2 (noting “there were . . . severed friend connections” and less playtime after *Fortnite* was removed from iOS).)

- c. By removing *Fortnite* from iOS, Apple has hindered Epic’s access to the key area of growth for *Fortnite*: mobile. (Weissinger Trial Tr. 1308:23-1309:5 (explaining that a mobile user base is different from Epic’s existing *Fortnite* user base), *id.* at 1311:1-4 (noting that *Fortnite* has “reached a pretty significant penetration on console” of “80, maybe 90” percent and has therefore been “specifically focusing on partnerships or collaborations that have wide social reach and inherently also wide mobile reach”); DX-

3233.8 (indicating there is a particular growth opportunity on mobile for new female users).) Mobile is particularly attractive to Epic's growth plan because people take their smartphones everywhere they go. (Weissinger Trial Tr. 1347:7-18.)

C. Fortnite Game Modes.

459. Most gameplay in *Fortnite* is multiplayer and requires an internet connection. People can play *Fortnite* online with friends and family, with teams or with other gamers of similar skill levels with whom they are matched. (Sweeney Trial Tr. 107:12-18 (“In a social game like *Fortnite*, players typically play[] together with other friends . . . [a]nd they are often playing socially or with voice chat.”).)

460. *Fortnite* includes three main game modes: (i) *Save the World*, (ii) *Battle Royale*, and (iii) *Creative*. (Sweeney Trial Tr. 99:5-10, 328:4-8; Weissinger Trial Tr. 1354:23-24.)

461. *Fortnite: Save the World* was the original game mode launched in July 2017. *Save the World* is a cooperative campaign where squads of up to four players team up to build forts and fight non-playable, computer monsters. (DX-5536.4.) *Save the World* is not available on mobile platforms or on the Nintendo Switch. (Weissinger Trial Tr. 1354:18 (“*Save the World* was not available on iOS”), *id.* at 1354:21 (“*Save the World* is also not available on Switch.”).)

462. *Fortnite: Battle Royale* is a player-versus-player elimination and survival match involving up to 100 players. (DX-5536.1-2) *Battle Royale* is the most popular *Fortnite*

gameplay mode with storylines and gameplay that evolve over time, as new chapters and seasons are released. (Sweeney Trial Tr. 99:5-10 (“Our most popular gaming experience in *Fortnite* is *Fortnite’s Battle Royale* mode. This is a 100-player experience where lone players or duos or squad drop into the island together and fight, using fairly traditional gaming mechanics within the world of *Fortnite* until one team prevails at the end of the match.”), *id.* at 105:21 (“*Fortnite* evolves through a series of seasons . . .”).)

- a. Epic also offers users a “sit out” feature, which permits them to observe *Battle Royale* matches instead of competing. (Weissinger Trial Tr. 1296:14-1297:5.)
- b. A season typically lasts around 10 weeks and is a subset of a larger chapter. (Weissinger Trial Tr. 1393:14-19.)
- c. Although the *Battle Royale* gameplay mode is available to download and play free of charge, users can make a range of in-app purchases for digital content. (Sweeney Trial Tr. 108:15-16, 108:18-20.) In-app purchases include special and limited edition digital avatars, costumes, dance moves and other cosmetic items. (Sweeney Trial Tr. 108:23-109:3.)

463. *Fortnite*: *Creative* mode allows users to create their own content in *Fortnite*. (Sweeney Trial Tr. 328:4-8 (“Within *Fortnite*, *Creative*—this is just a tool for creating your own *Fortnite* island.”).) *Creative* mode is further described on Epic’s website: “Included free with Battle Royale, Fortnite Creative puts you in charge of your own Island . . . Creative is

also a great place for just creating your own scenery. Make your Island how you want it to look and enjoy it with your friends!” (DX-5536.3.)

D. *Fortnite* as a Social Space.

464. *Fortnite* connects players from around the world in a social experience that, for many, could not be replicated outside the app. (Sweeney Trial Tr. 107:14-18 (“So the magic of *Fortnite* is the ability to play together with people you know in the real world and have a shared social experience, even if you are in different places and on different devices.”) *Fortnite*’s capacity to bring people together has been particularly important during the COVID-19 pandemic. (See Weissinger Trial Tr. 1295:8-16 (explaining that *Fortnite* allowed people “to stay socially connected to each other” while “locked down” due to the pandemic).)

465. *Fortnite* has several features that enable social interactions outside of gameplay. (Sweeney Trial Tr. 120:7-12 (“[W]e built . . . Epic’s friends system . . . for *Fortnite*.”), *id.* at 98:6-7: (“*Fortnite* has a mode called *Fortnite Party Island*, which includes a variety of entertainment experiences.”).)

466. *Fortnite* is one of the world’s largest event venues. Users can see movies, watch concerts or attend cultural events with their friends within the app. (Sweeney Trial Tr. 98:16-99:1 (“*Fortnite Party Island* . . . includes a variety of entertainment experiences. Some are gaming but others are not gaming related at all. We have held concerts[,] . . . showed several feature-length films . . . [and played] a prerecorded social dialogue that players can visit and listen to and also talk about socially . . .”).) These in-game social events do not involve competitive game play. (Sweeney Trial Tr. 102:18-22, 103:24-104:1, 105:14-16.)

- a. Travis Scott's in-game concert in April 2020 drew 12.3 million concurrent users, including 2 million iOS users. (Weissinger Trial Tr. 1294:10-22.)
- b. Three of Christopher Nolan's feature-length films—*The Dark Knight*, *Inception* and *The Prestige*—were virtually screened within in June 2020 *Fortnite*. (Sweeney Trial Tr. 103:12-16; Weissinger Trial Tr. 1289:8-25.)
- c. Exclusive episodes of ESPN's *The Ocho* and the Discovery Channel's *Tiger Shark King* aired within *Fortnite*. (Sweeney Trial Tr. 104:16-24.) More than two million users viewed *The Ocho*, while over 900,000 users viewed *Tiger Shark King*. (Weissinger Trial Tr. 1290:5-7, 1290:16-23.)
- d. Epic has aired *We the People*, a series of discussions on “racial equality and voter suppression in the United States”, within *Fortnite*. (Sweeney Trial Tr. 105:5-7.) There were 1.5 million viewers. (Weissinger Trial Tr. 1291:5-11.)
- e. In March 2021, the DJ Kaskade hosted a virtual concert on *Fortnite*. (Weissinger Trial Tr. 1293:25-1294:1.)

467. *Fortnite* continues to evolve from a social game into a more immersive and varied social space that competes not only with gaming companies but also with other social media companies such as Facebook and Netflix. (Sweeney Trial Tr. 94:4-7 (“In the area of our

consumer apps, our competitors range from other social ecosystem companies, such as Facebook and *Roblox*, to other game developers such as Activision or Electronic Arts.”), *id.* at 98:16-99:3 (describing *Fortnite Party Island* as “a real-time 3D social session where you’re watching something like a Netflix movie”.).)

E. Cross-Progression Enhances the Complementary, Not Substitutable, Nature of Other Platforms.

468. *Fortnite* supports cross-progression, which means *Fortnite* users can access *Fortnite* across multiple platforms using the same account. This feature allows users to access the same in-game content, and maintain their progress, regardless of the platform on which they play. For users who play *Fortnite* on multiple platforms, cross-progression is an important feature. (Sweeney Trial Tr. 108:3-11 (“Cross-progression refers to people who have—a user who owns multi devices to connect with *Fortnite* on different—on these different platforms, and to have the same progression or state [of] ownership of virtual items on all different platforms; meaning that if you go into *Fortnite* on iOS, for a time *Fortnite* outfits you owned on iOS and *Fortnite* record of progress that you had, would be carried over if you left iOS and went over to Xbox, or if you left Xbox and came back to iOS.”).)

469. *Fortnite* is best experienced on a PC or console, where players can take advantage of a large screen and dedicated game controllers. (Sweeney Trial Tr. 139:15-23, 146:8-17; Grant Trial Tr. 692:8-693:1, 698:15-699:3.)

470. *Fortnite* users generally cannot access a PC or console while on the go, such as when they’re riding a subway or waiting for an appointment. (Grant Trial Tr. 689:14, 693:11-18.)

471. Most *Fortnite* users play on a single platform. (PX-1054.) [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED] (Sweeney Trial Tr. 196:19-22; Apple Ex. Depo. 2 at 39:24-41:9, 41:14-16 (Kreiner); DX-4133.6-9, 12.)

- a. Epic's data shows that iOS users who play *Fortnite* on multiple platforms spend most of their time within the game on non-iOS platforms, suggesting they only play on mobile where such alternatives are not available. (DX-4763.1; PX-1045.1.)
- b. More than 115 million registered users have accessed *Fortnite* on an iOS device—more than any other platform. (Ex. Expert 6 (Hitt) ¶¶ 62, 71, Figure 13.)
- c. But 64% of *Fortnite* for iOS users—73 million in total—have only ever played *Fortnite* on iOS, suggesting they do not have a readily available alternative. (Ex. Expert 6 (Hitt) ¶¶ 62, 71, Figure 13 (64.1% of 115 million iOS users).)

472. *Fortnite* also supports cross-purchases, which means that—with the exception of the Sony and Nintendo platforms—*Fortnite* users can buy V-Bucks on one platform and spend them on another platform. (Sweeney Trial Tr. 197:1-5, 198:1-3.)

F. Epic Games Store.

473. Epic launched the Epic Games Store—also known as EGS—in December of 2018. (Sweeney Trial Tr. 123:10-13; Allison Trial Tr. 1199:17.)

474. EGS both publishes and distributes apps. (Sweeney Trial Tr. 124:2-5; Allison Trial Tr. 1198:19-20, 1218:22-1219:10.) A publisher “typically funds most or all of the expenses associated with the entire product, including development and marketing; whereas, a distributor typically only pays the cost associated with direct distribution, such as in the digital . . . bandwidth and payment with processing fees”. (Sweeney Trial Tr. 96:24-97:4.) EGS offers developers an 88/12 split of all revenues from the sale of their games through EGS. For distribution services, EGS also provides developers the choice of using Epic direct payment for in-app purchases within their apps, an optional service it also offers for a 12% commission on sales. (Sweeney Trial Tr. 126:1-8; 307:15-17 (“Services of Epic Games Store [a]s a digital distributor are entirely different than the services Epic provides and has offered to developers as a publisher.”).)

a. EGS’s primary competitor is the digital PC store, Steam, operated by Valve Corp. (Sweeney Trial Tr. 94:22-25 (“And with respect to the Epic Games Store and the PC and Mac market, our competitors include stores that publish games for many publishers. Stores that distribute games for many publishers, such as Steam . . .”); *see also* Allison Trial Tr. 1202:2-4 (describing Steam’s “dominant” market share).)

- b. Steam, as the incumbent, is the source for a substantial share of all game downloads on PC computers. (Allison Trial Tr. 1202:2-4; 1212:21-23; 1285:4-6; *see also* Patel Trial Tr. 424:12-13 (“Steam . . . had approximately 30,000 games on their service.”).)
- c. Originally launched in 2003, Steam had historically charged developers a 30% commission. (Sweeney Trial Tr. 174:4-5, 174:10-14.)
- d. In November 2018, just days before Epic launched EGS with a 12% commission, Steam announced that it was implementing a tiered commission structure whereby it would charge developers 30% on the first \$10 million in sales for an app, 25% on sales between \$10 million and \$50 million, and 20% on all sales above \$50 million. (Allison Trial Tr. 1209:16-1210:1.)
- e. More recently, Microsoft announced that it was lowering its commission on the Windows Store to the same 88/12 split as EGS. (Allison Trial Tr. 1275:24-1276:5.)
- f. Neither Apple nor Google lowered its 30% commission rates in response to the decisions by Epic and Steam. (Schmalensee Trial Tr. 1957:23-1958:12.) When asked whether Apple felt any pressure to respond when Steam reduced its price, Mr. Cook testified that he was not even “familiar with Steam” despite

Apple's argument that it faces "huge competition for developers".

(Cook Trial Tr. 3993:2-8.) And in fact, Apple's economists cannot point to "any evidence of platforms responding to pricing or other term changes made by gaming transaction platforms that are used on other devices". (Schmalensee Trial Tr. 1958:13-1959:8.)

475. In terms of digital game sales on PCs and Macs, the Epic Games Store is "[a] clear and strong number two" behind Steam. (Allison Trial Tr. 1221:4-7.) It currently has more than 500 titles, more than 100 developers, 50 million monthly active users and 180 million accounts. (Allison Trial Tr. 1220:8-25.)

476. Epic has had discussions about expanding EGS's offerings to include mobile apps. (Allison Trial Tr. 1233:8-10, 1233:22-1234:8.)

477. Currently, Apple prevents users from downloading EGS onto iOS. (Sweeney Trial Tr. 127:10-11 ("Apple does not allow third parties to distribute stores for iOS.")); Allison Trial Tr. 1233:8-17.)

- a. Users cannot download and install EGS on their iPhones directly from Epic's servers. (Sweeney Trial Tr. 127:10-11; *see* Allison Trial Tr. 1233:11-14.)
- b. EGS's inability to achieve distribution on iOS prevents it from obtaining the scale that would enable further innovations and consumer offerings. (Sweeney Trial Tr. 97:24-98:4 ("[O]ur Epic Games Store business is harmed by Apple's policies because we

are barred from introducing a version of our store for iOS. So we can operate on PC and Mac, but we cannot, because of Apple's policies, distribute apps on iOS, and that locks us out of a very large worldwide business we would love to be in.”); Allison Trial Tr. 1234:2-8.)

G. Distribution of EGS.

478. At present, EGS is available for direct download onto PCs and Mac computers through Epic's website. (Allison Trial Tr. 1198:18-20.)

479. Epic would like to make EGS available on iOS. (Sweeney Trial Tr. 97:24-98:4; Allison Trial Tr. 1233:8-10.)

480. Apple has prevented Epic from offering EGS to iPhone users by enforcing restrictive policies that forbid third parties from competing with the App Store to reach over one billion users on iOS devices. (Sweeney Trial Tr. 98:1-4, 112:13-17; Allison Trial Tr. 1233:11-17 (“Current policies around content delivery, networks, delivering code and using payments would preclude us from spinning up an effort [on iOS]”)).

481. Today, EGS has over 180 million registered accounts and more than 50 million monthly active users. (Allison Trial Tr. 1220:21-25.)

482. EGS supports more than 100 third-party app developers and publishes over 400 of their apps. (Allison Trial Tr. 1220:18-20.)

483. To create a positive user experience on EGS, Epic has invested substantial resources into acquiring distribution rights for popular games, as well as developing new store features. (*See* Allison Trial Tr. 1214:1-8, 1217:14-22, 1218:18-1220:7.)

- a. Over the past year, Epic has added multiple new features to EGS. For example, “in December 2019, we only supported 10 different currencies. Now we are supporting 42 local currencies.” (Ko Trial Tr. 801:4-6.)
- b. EGS gives away different free games to users each week and also runs seasonal events. (Sweeney Trial Tr. 262:4-6 (“There are several free games that are always free. And then each week we offer a new game free for just that week.”); Allison Trial Tr. 1219:19-1220:7, 1225:6-7.)

484. EGS operates a single storefront across multiple geographies. (Sweeney Trial Tr. 129:10-13.)

485. Epic expects EGS to become profitable within “three or four years”. (Sweeney Trial Tr. 127:4-6; *see also* Allison Trial Tr. 1232:14-22 (noting the Epic Games Store expects distribution of its third-party content to “first turn a profit” in 2024 and that, when Epic’s first-party content is included, EGS will turn a profit in either 2022 or 2023); PX-2469.7 (Epic Games Store projected Profit and Loss statement).) It is currently outperforming its projected business plan by “about 15 percent”, and its first-party and third-party businesses are up 113% and 100%, respectively. (Allison Trial Tr. 1233:2-7.)

- a. EGS is not yet profitable at its current scale and stage of development because it has front-loaded its marketing and user-acquisition costs to gain market share. (Sweeney Trial Tr. 126:19-23 (“When you consider all of the costs of the Epic Games Store, it’s hundreds of millions of dollars short of being profitable because of the upfront investments we’ve made in the store.”); Allison Trial Tr. 1214:1-1215:6 (explaining EGS up-front investments in recoupable minimum guarantee deals to acquire content), *id.* at 1230:5-10 (noting that the EGS is not yet profitable as it is “in a period of growth and investment”).)
- b. EGS’s 12% transaction fee is sufficient to cover the variable costs of running EGS, including payment processing, customer service and bandwidth. (Sweeney Trial Tr. 126:9-10 (“12 percent is intended to cover all Epic’s variable operating costs.”); 126:14-18 (“Epic makes a gross profit on the variable cost associated with a new purchase. We make more money from the 12 percent than it typically costs us to cover the cost of that additional purchase, but that does not account for all of the storage costs, such as marketing and exclusive products.”).)
- c. Epic expects EGS to recover its up front investments in content over the long term. (Allison Trial Tr. 1230:5-10.) This includes

the investments it has made in acquiring content for the store. (Allison Trial Tr. 1232:22-1233:1.)

486. “[Epic] process[es] transactions either directly or through a payment processing partner in at least a hundred different countries.” (Sweeney Trial Tr. 130:3-7.)

H. Epic’s Financial Arrangements with Developers Distributing Through EGS.

487. Epic enters into a variety of financial arrangements with third-party developers to distribute their apps through EGS. (*See, e.g.*, Allison Trial Tr. 1214:1-8 (explaining minimum guarantees), *id.* at 1223:8-13 (noting that some developers have chosen not to use Epic’s payment processor).)

488. Epic does not require any developer to use its payment processing system, called Epic direct payment, for in-app purchases. (Sweeney Trial Tr. 125:23-25 (“[T]here is a commission on in-app purchases, which is only charged when a developer uses our payment processing method.”); Ko Trial Tr. 800:4-14 (explaining that developers have the option to use Epic’s payment solutions); Allison Trial Tr. 1221:21-1222:12 (same).)

- a. Developers who do not use Epic direct payment do not pay Epic anything for in-app purchases. (Sweeney Trial Tr. 125:23-25.)
- b. Several app developers have elected to use their own payment and purchase functionality for in-app purchases. For instance, the developers Ubisoft and Wizards of the Coast use their own payment processing system for in-app purchases in their games distributed through EGS. (Allison Trial Tr. 1223:8-20.)

489. To date, third party developers have made about \$500 million in revenue through the Epic Games Store. (Allison Trial Tr. 1223:22-25.)

490. Prior to deciding on the 12% revenue share, EGS considered its own costs and revenues and considered the revenue shares of competing distributors of PC games. (See Allison Trial Tr. 1208:5-1209:8, 1210:14-23.)

- a. Epic decided to charge developers a 12% revenue share after it concluded that 12% would be competitive, sufficient to cover its costs of distribution and allow for further innovation and investment in EGS. (Sweeney Trial Tr. 126:9-10 (“12 percent is intended to cover all Epic’s variable operating costs.”); Allison Trial Tr. 1210:14-23.)
- b. Epic also wanted to help developers get as close to self-publishing costs as possible because it understood that many developers had grown dissatisfied with Steam’s 30% commission. (Allison Trial Tr. 1205:17-12:09:12.)

491. For PC and Mac apps developed using *Unreal Engine*, Epic waives the *Unreal Engine* licensing fee for sales made through EGS. (Apple Ex. Depo. 2 at 242:18-24 (Kreiner).)

492. In exchange for its commission, EGS offers app developers several services: (1) distribution services (*i.e.*, hosting their games), (2) payment processing services

(*i.e.*, facilitating sales of their games and other digital products) and (3) merchandising services (*i.e.*, promoting and advertising their game). (Allison Trial Tr. 1224:4-1225:7.)

- a. Epic also maintains a developer portal for EGS where developers can publish their games, upload new builds and marketing assets, and access sales and financial data. (Allison Trial Tr. 1224:4-13.)
- b. Developers who distribute their games through EGS benefit from access to the platform's substantial, growing user base. (Allison Trial Tr. 1220:18-25.)

I. EGS Security.

493. Epic has developed EGS with security in mind. (*See* Allison Trial Tr. 1225:8-1227:18.)

- a. EGS utilizes email verification when new users create store accounts. (Allison Trial Tr. 1225:15-18.)
- b. EGS requires multi-factor authentication and account ownership verification. (Allison Trial Tr. 1225:23-1226:2.)
- c. EGS employs tools to detect, and protect users against, automated login requests. (Allison Trial Tr. 1225:19-22, 1226:3-7.)
- d. EGS has never had any instances of known malware or digitally pirated content on the store. (Allison Trial Tr. 1228:3-8.) It runs “malicious software scans” to look for malware. This scan also detects pornographic imagery, which Epic does not permit on its

store. (Allison Trial Tr. 1227:22-1228:2; *see also* Allison Trial Tr. 1256:11-13.)

494. Epic continues to take security seriously because “[i]t’s really hard to successfully run a digital business if you don’t have strong security for your partner and your players”. (Allison Trial Tr. 1229:22-1230:2.)

495. Like any digital storefront, EGS has experienced instances of payment fraud. (Allison Trial Tr. 1228:9-11; *see also* Ko Trial Tr. 805:11-17.)

496. In the first few months EGS was in operation, there was one particular incident where “a group of bad actors” exploited Epic’s “dual entitlement” program with Ubisoft which generated a large volume of fraudulent transactions. As soon as Epic learned about the exploit, it halted sales of Ubisoft titles until the exploit could be corrected. Epic has not had any issues with its dual entitlement program with Ubisoft since. (Allison Trial Tr. 1228:12-1229:14.)

497. Epic and Ubisoft—not EGS users—were the victims of the fraudulent activity, and Epic in the end “paid Ubisoft for every unit that was fraudulently refunded”. (Allison Trial Tr. 1229:15-19.)

J. Epic Online Services (“EOS”).

498. Epic offers game developers EOS, an SDK containing a suite of tools. (Sweeney Trial Tr. 120:7-10.)

499. EOS includes tools to set up matchmaking, allow users to see when their friends are online and enable voice chat. (Sweeney Trial Tr. 120:11-14.)

500. EOS gives developers the option to use Epic's user account system for their own games, although they are not required to do so. (Sweeney Trial Tr. 120:7-10 ("Epic Online Services is a software development kit that we make available to other game developers that provides many of the social features that we built for *Fortnite* and makes them available to other companies, such as Epic's account system . . .").)

501. EOS is compatible with multiple platforms and software engines including Windows, Mac, Linux, PlayStation, Xbox, Nintendo Switch, iOS and Android. The EOS SDK also can be integrated with an app that uses any graphics engine, including both *Unreal Engine* and a popular competitor called *Unity*. (Sweeney Trial Tr. 120:19-21 ("They support iOS, Android, Windows, Mac, Linux, Xbox, PlayStation, and Nintendo Switch."), *id.* at 121:1-4 ("[I]t is available on the variety of programming languages and can be used in the Unity engine, the open source Godot engine, or in-house engines . . . created by developers.").)

502. EOS is free. (Sweeney Trial Tr. 121:8-9.)

K. iOS is an Important Distribution Channel for *Fortnite*.

503. Because apps are specific to an operating system, Epic had to build separate versions of *Fortnite* for each platform on which it chooses to offer *Fortnite*. (Grant Trial Tr. 691:5-10 ("Q. Is the version of *Fortnite* that Epic has written for the PC the same or different from that written for the mobile device? A. They share many common aspects of code, the business logic that I referred to earlier, but they have very distinct code, for example, to handle input.").)

504. Epic's ability to offer competitive and attractive digital products depends on its ability to offer mobile apps to consumers. (Sweeney Trial Tr. 112:3 ("iOS is a vital platform for a business."), *id.* at 112:13-17 ("And reaching the entire base of Apple is 1 billion iPhone consumers is a paramount goal for our company, as Fortnite expands beyond being a game into this larger world of the metaverse."); Grant Trial Tr. 671:13-20 ("It's the only way we can access a hundred percent of [a platform's] users or at least have the option of accessing a hundred percent of that market. And that applies for game consoles, mobile devices, and personal computers.").)

505. From the time *Fortnite* was launched on iOS in 2018 through August 13, 2020, it averaged 2.5 million daily iOS players, representing nearly 10% of *Fortnite*'s total average daily players. (Weissinger Trial Tr. 1346:18-1347:1.) iOS users have spent more than 2.86 billion hours in the app. (Weissinger Trial Tr. 1346:21-22.)

506. iOS is an important platform to Epic in terms of *Fortnite* revenue. [REDACTED]

[REDACTED]

[REDACTED]

L. Engineering Issues.

507. Apple's requests and requirements have caused Epic to spend considerable engineering time and resources to keep *Fortnite* in compliance with Apple's changing developer rules. (Grant Trial Tr. 730:10-12 ("Apple would frequently [modify] the [A]pp [R]eview [G]uidelines to require us to support new features in [their] OS or new types of hardware.").)

508. The engineering issues Epic discussed with Apple covered:

- a. the discovery of “bugs in iOS that we believed were in Apple’s software and not ours” (Grant Trial Tr. 731:11-13);
- b. memory usage and bugs affecting Epic’s ability to implement and support iOS and macOS features (Grant Trial Tr. 730:22-731:13; PX-856 (noting the iOS 12 memory issue); PX-452 (noting the “significant amount of engineering time” that Epic invested in “reducing the memory footprint” of *Fortnite*));
- c. investigation into rendering issues in *Fortnite* caused by Apple’s Metal software (Apple Ex. Depo. 5 at 95:19-96:3, 244:3-15 (Penwarden); Schmid Trial Tr. 3310:1-10 (“Q. Do you recall that the issue was associated with iOS 11 that had certain memory allocations issues? A. I do recall, yes. Q. So -- and in iOS 12, there was a change in those allocations. Do you remember that? A. I do. Q. And that’s what caused these memory issues with certain developers? A. It functionally reduced the amount of available memory for a developer to leverage in certain circumstances.”); *id.* at 3335:13-18 (noting that Epic had eight full-time engineers working to address the issue as compared with only one full-time engineer dedicated by Apple)); and
- d. Epic’s testing and providing feedback on Apple developer tools (Grant Trial Tr. 731:7-10 (“[W]e would often provide Apple with

feedback, things we observed in the tools, perhaps suggestions how functionality could be improved based on either our experience or our knowledge of other platforms.”).).

509. Epic also spent nearly a year working to implement Apple’s “Sign in with Apple” service after it was made a mandatory. (Grant Trial Tr. 730:14-21 (“Two of the more memorable ones were [S]ign-in with Apple where Apple required any app that supports common accounts for authentication such as being able to use your Google account to sign in for your Facebook account; you would sign in with Apple, Apple required that you then also support their new system. That was probably—that was months of work for many people, Epic probably, you know, a couple of man years of work.”); *see also* Schmid Trial Tr. 3268:3-5 (recalling that Epic had to work through issues with Sign in with Apple); DX-4270.49 (noting “Apple’s new login process for Apps” was an “[o]utstanding [c]hallenge” for Epic’s mobile business.)

510. Epic officers and employees, including Mr. Sweeney himself, were invited several times to Apple’s Worldwide Developers Conference to showcase Apple’s hardware and graphics APIs through demonstrations of how those could be used by *Unreal Engine*. (Schiller Trial Tr. 2899:14-2900:10; DX-3462.)

M. Epic’s Experience on iOS.

511. Epic had a Developer Program account with Apple. (*See* Grant Trial Tr. 721:14-722:1; PX-2619.)

- a. Epic first opened its Developer Program account in September 2010. (Sweeney Trial Tr. 89:20-90:2.)

512. As of August 28, 2020, Epic's Developer Program account was associated with multiple apps distributed through the App Store: *Fortnite*, *Battle Breakers* and *Spyjinx*. (Grant Trial Tr. 664:13-15; DX-4322.)

513. Epic owns and operates a number of subsidiaries that relate to different parts of its business. (Sweeney Trial Tr. 304:14-16 (“Q. [D]oes the entity that sued Apple have any financial interest in the entity that owns the *Unreal Engine*? A. Yes. It’s all 100 percent owned.”), *id.* at 305:14-16 (“Q. Does the entity that sued [Apple] have an interest in the subsidiary that owns *Houseparty*? A. Yes.”).)

514. Five of Epic's subsidiaries have separate Developer Program and/or Developer Enterprise Program accounts pursuant to separate agreements with Apple. (Grant Trial Tr. 724:8-725:21.)

515. Epic's subsidiary Epic Games International S.à r.l. (“Epic International”) has a Developer Program account with Apple. (Grant Trial Tr. 724:11-16, 725:19-21.)

- a. Epic International's Developer Program account is currently associated with apps distributed through the App Store including non-game apps such as *Unreal Remote* and *Live Link Face*. (Grant Trial Tr. 724:11-16; 664:21-665.)
- b. Epic International has entered into a Developer Agreement and Developer Program License Agreement with Apple for its account. These agreements are separate from Epic's agreements. (Grant Trial Tr. 724:8-25, 725:19-21.)

516. Epic's subsidiary Life on Air has a Developer Program account with Apple. (Grant Trial Tr. 724:17-22, 725:19-21.)

- a. Life on Air's Developer Program account is associated with the *Houseparty* app for iOS and macOS. (Grant Trial Tr. 724:19-20.)
- b. Life on Air has entered into a developer agreement with Apple. The Life on Air agreement is separate from Epic's other entities' agreements. (Grant Trial Tr. 724:17-22, 725:19-21.)

517. Epic's subsidiary Ka-Ra S.A.S. has a Developer Program account with Apple. (Grant Trial Tr. 725:1-7, 725:19-21.)

- a. There are currently no apps distributed through the App Store associated with the Ka-Ra S.A.S. Developer Program account. (Grant Trial Tr. 724:8-725:21.)
- b. Ka-Ra S.A.S. has entered into a developer agreement with Apple. This agreement is separate from Epic's other entities' agreements. (Grant Trial Tr. 725:1-7, 13-14, 19-21.)

518. Epic's subsidiary Psyonix has a Developer Program account with Apple.

- a. There are currently no apps distributed through the App Store associated with Psyonix's Developer Program account. (Grant Trial Tr. 725:8-16; 724:8-725:21.)

b. Psyonix has entered into a developer agreement with Apple. This agreement is separate from Epic's other entities' agreements.

(Grant Trial Tr. 725:8-9, 15-16, 19:21.)

519. Epic's subsidiary Games Sweden Scanning AB ("Epic Sweden"), formerly Quixel AB, has a Developer Program account with Apple. (Grant Trial Tr. 725:10-12, 17-21.)

a. There are currently no apps distributed through the App Store associated with Epic Sweden's Developer Program Account.

(Grant Trial Tr. 724:8-725:21.)

b. Epic Sweden has entered into a developer agreement with Apple. This agreement is separate from Epic's other entities' agreements.

(Grant Trial Tr. 725:10-12, 17-21.)

N. Epic Has Disagreed with Apple's Policies for Years.

520. Mr. Sweeney has long been outspoken regarding his view that Apple should open up iOS to competing app distribution and payment processing solutions. (Sweeney Trial Tr. 88:8-17.)

521. In June 2015, Mr. Sweeney emailed Mr. Cook urging Apple to consider "separating iOS App Store curation from compliance review and app distribution". He noted that "it doesn't seem tenable for Apple to be the sole arbiter of expression and commerce over an app platform approaching a billion users." (PX-2374.1.)

522. In January 2018, Mr. Sweeney sought a meeting with Apple through Mark Rein, Epic's Vice President, "to talk about the potential for iOS and future Apple things to operate as open platforms" and discuss how Epic has "a PC and Mac software store and would love to eventually support it on iOS". He added: "If the App Store we[re] merely the premier way for consumers to install software, and not the sole way, then Apple could curate higher quality software overall, without acting as a censor on free expression and commerce on the platform . . ." (PX-2421.1.)

523. In September 2018, an Apple representative contacted Epic to inform Epic that the Vietnamese Authority of Broadcasting and Electronic Information ("ABEI") had contacted Apple and demanded that it remove *Fortnite* from the App Store in Vietnam unless Epic obtained a license from ABEI. (PX-1667.3.) Apple asked Epic to obtain such a license. (*Id.*) Mr. Sweeney responded that Epic "cannot in good conscience obtain the Vietnam ABEI license as Apple asks" because Vietnamese law would "compel Epic to maintain data about Vietnamese users, including their communications, physically in Vietnam. Vietnamese authorities have broad investigative and enforcement powers, sufficient to force seizure or censorship of such data or, even more troublingly, to force Epic to collaborate with the Vietnamese government in investigating and acting upon outlawed forms of speech." (PX-1667.2.)

- a. Mr. Sweeney noted: "There are deep perils in Apple operating the only allowed software distribution facility on iOS, as it allows repressive regimes to demand developer participation in their

surveillance and censorship programs, using Apple as a proxy for enforcement. This peril does not exist on other general computing platforms such as Android, Windows, Mac, and Linux, in which users have the freedom to install software directly from sources of their own choosing.” (PX-1667.2.)

- b. In response, Apple stated that it “follows the law in all countries that it operates in, and Apple may be required to take appropriate action”. (PX-1667.1.)

524. On June 30, 2020, Mr. Sweeney wrote to Apple’s senior leadership team—Messrs. Cook, Schiller, Federighi and Fischer—asking for Apple to allow Epic to provide a competing app store and competing payment processing, and he expressed the wish that Apple “also make these options equally available to all iOS developers in order to make software sales and distribution on the iOS platform as open and competitive as it is on personal computers”. Mr. Sweeney explained that providing these options to iOS device users would allow consumers “an opportunity to pay less for digital products and developers would earn more from their sales”. (DX-4477.1; *see also* Sweeney Trial Tr. 88:1-17.)

525. In July 2020, Mr. Sweeney received a reply in which all of his requests were rejected. (Sweeney Trial Tr. 88:13-16.)

526. On July 17, 2020, Mr. Sweeney wrote back to Apple, expressing his continued disagreement with Apple’s policies and practices. He wrote: “Epic is in a state of

substantial disagreement with Apple's policy and practices, and we will continue to pursue this". Apple did not respond. (PX-2458.1.)

527. Given Apple's continued refusal to change its policies, Epic chose to take a stand against Apple and demonstrate through Epic's own actions that competition for payment solutions could exist on iOS, and that consumers would welcome and benefit from such competition. (Sweeney Trial Tr. 88:4-17.)

528. On August 13, 2020, Mr. Sweeney informed Apple that in the *Fortnite* app on iOS, Epic was launching Epic direct payment, which was based on the payment system Epic uses to process transactions on PC, Mac and Android for *Fortnite* and EGS. (Sweeney Trial Tr. 127:12-20; 294:14-16 ("Q. And you notified Apple around 2:00 a.m. Pacific Time on August 13th, correct? A. Yes."); *see also* PX-2450.)

529. That same day, Epic announced the *Fortnite* "Mega Drop", a permanent price reduction of up to 20% for *Fortnite* in-app purchases on PC, Mac, Xbox, PlayStation, Switch and certain Android storefronts. (Sweeney Trial Tr. 156:7-11 ("At the same time we introduced this hot fix [on] iOS, we introduced a different hot fix on other platforms implementing what we called the *Fortnite* Mega Drop, which represented an approximately 20 percent price drop in the price of *Fortnite* items offered to users . . .").)

530. On iOS, *Fortnite* users were given the option to choose which payment processor to use. Players could continue to make their purchases using Apple's IAP, in which case they would continue to pay the pre-Mega Drop prices, or they could use Epic direct payment option and pay the new price, which was 20% less. (Sweeney Trial Tr. 156:11-16.)

a. Epic believed this approach of lowering prices would have a positive effect on the *Fortnite* community while also ensuring that any differential pricing would demonstrate in full public view how Apple's IAP requirement imposes a real cost to consumers relative to other payment methods. (Sweeney Trial Tr. 160:6-8 ("[W]e wanted to demonstrate to smartphone owners that removing the platform fees resulted in savings to them.").)

531. Epic understood that Apple might respond to the introduction of a competing payment solution by removing *Fortnite* from the App Store. (Sweeney Trial Tr. 171:12-15 ("I wasn't certain [Epic would be removed from the developer program]. I was very aware of the possibility of it, and even the likelihood of it, but I was not completely certain that Apple would respond by removing *Fortnite*.")) But Epic also viewed it as critical to demonstrate through public action that competition for payment solutions could exist on iOS, and that there would be strong demand from consumers for such competing options. (Sweeney Trial Tr. 160:6-8.)

532. Epic is not seeking a special deal from Apple; it is seeking industry change. (Sweeney Trial Tr. 93:3-7 ("A. Is Epic seeking a special deal from Apple in connection with the filing of this lawsuit? A. No. The remedies . . . that we are seeking here are the changes to Apple's behavior that would affect the entire market, and all participants in it.").) Epic did not sue for damages for this reason. (Sweeney Trial Tr. 92:23-25 ("Q. Is Epic seeking damages in this lawsuit? A. No. Epic is solely seeking changes to Apple's future behavior.").)

O. The Hotfix.

533. The technical manner in which Epic enabled Epic direct payment on August 13, 2020, was via a “hotfix”. (Sweeney Trial Tr. 153:14-15, 154:25; Grant Trial Tr. 736:11-15 (“On the 13th of August, we made a hotfix to our servers that informed iOS clients that they now have access to . . . two payment methods, Apple’s in-app purchases and Epic Direct Play.”).)

534. Hotfixes work by coding an app to check for new content that is available on the developer’s server or new instructions on how to configure settings in the app. (Grant Trial Tr. 734:10-13 (“[W]e use that term [“hotfix”] to mean making a change on our servers that alter[s] the availability or even behavior of a function in our applications without requiring that the user download an update to the application.”).)

535. A developer can use hotfixes to activate content or features in an app that are in the code but are not initially available to users. The content or feature is accessible only after the app checks the developer’s server and is “notified” by the server to display the new content or feature. (Grant Trial Tr. 734:22-735:9 (“It would be changing a configuration on a server to cause it to report to applications that[] slightly different behavior was being requested. It could be as simple as making something available or unavailable. It’s how we might allow users in *Fortnite* to have access to a specific type of game for a period of time or a specific cosmetic. It can also be used to change the behavior[,] [i]f we see something that could be improved. *Fortnite* is a competitive game, and there are many aspects of the game that are

balanced against each other. If we see that certain type[s] of game play or a certain weapon is overly powerful, we can make a hotfix change to reduce its effectiveness.”).)

536. Across all platforms where *Fortnite* is available, including iOS, Epic has used hotfixes to enable hundreds of new features and content elements and correct configuration issues since *Fortnite* was first added to the App Store. (Grant Trial Tr. 735:15-19 (“It would be like a weekly occasion. We would rotate different types of game notes in and out. If there was a big event . . . taking place during the season, that would be hotfixed on at the appropriate time so users could experience it.”).) For example, Epic uses hotfixes to implement its highly popular in-game events in *Fortnite*. (Grant Trial Tr. 735:15-19.)

537. On August 13, 2020, Epic used a hotfix to activate the Epic direct payment option within the *Fortnite* iOS app. (Grant Trial Tr. 736:11-15.)

P. Epic Direct Payment.

538. Developers selling digital content, such as Epic, require some way to enable consumers to seamlessly and efficiently make purchases in their apps. (*See Sweeney* Trial Tr. 110:17-111:1 (explaining why in-app purchases are more seamless than out-of-app purchases.))

539. The online payments industry has grown over the last two decades to provide specialized and innovative solutions for handling payments online. There are a number of third-party payment processors such as Stripe, Adyen, Amazon Pay, Braintree, PayPal, Chase, Checkout.com and Square. (Ko Trial Tr. 803:2-6; PX-2452.3; Fischer Trial Tr. 907:4-12; Simon Trial Tr. 353:3-7.)

540. When free to do so, an app developer like Epic can select the payment processor (or combination of payment processors) that best enhances the user experience and helps facilitate seamless, cost-effective and efficient payment solutions within an app. (Ko Trial Tr. 806:11-21; PX-2452.3.)

541. Epic has worked with a number of third-party payment companies to offer its own payment solution for its apps distributed directly on Android devices and via the Epic Games Store on PCs and Macs. (Ko Trial Tr. 799:8-25; 800:4-14; 803:2-6; 803:25-804:5.) Prior to August 2020, Epic had processed over \$1 billion of financial transactions through its own payment solution. (Sweeney Trial Tr. 128:3-8.)

542. In 2020, the average fee Epic paid for processing payments for its own U.S. and international ecommerce outside of iOS was 4.2%. (Ko Trial Tr. 806:22-807:3.)

543. As early as 2019, Epic considered “whether Epic ought to eventually offer payment processing as one of the Epic Online Services” so that Epic would be “ready to go the moment Google and Apple ecosystems are opened up to third-party payment services”. (DX-4496.2.) Recognizing that there was no “truly comprehensive solution” outside of Apple and Google’s products, Epic set out to develop a world-class payment solution, adding currencies to reach users all over the world, including in developing countries, holding a competitive request for proposal (“RFP”) process to select and improve its payment service providers, and beginning development on features to benefit customers and developers who used its solution. (Ko Trial Tr. 801:1-18; 801:23-802:20; 807:14-808:4; 818:5-15; *see also* DX4496.1-2.)

a. “The purpose of the RFP was to bring healthy competition[] in payment service[s] . . . in Epic ecosystems”. (Ko Trial Tr. 813:6-7.) When they learned about the RFP process, many existing service providers “reduced their fees”. (Ko Trial Tr. 813:12-14.)

544. In early 2020, Epic solicited competitive bids from five global payment processors: Adyen, Worldpay, Braintree, Checkout.com and Stripe. These firms submitted responses to over 100 questions covering 14 different categories, including product, engineering, finance, user interface, fraud and coverage. After an extensive review, Epic selected Adyen for integration in China and Europe, and Braintree for Latin America. (*See* PX-2451 (email from PayPal responding to the payment processor questionnaire); PX-2452; *see also* Ko Trial Tr. 807:14-21.)

545. The Epic direct payment solution includes a variety of features such as regional pricing and payment support in 42 different currencies, combined with outsourced payment processing from providers like Chase, PayPal and Adyen. (Ko Trial Tr. 800:19-801:6; Sweeney Trial Tr. 130:3-7 (“We process transactions either directly or through a payment processing partner in at least a hundred different countries.”).)

546. The Epic direct payment option that Epic implemented in the iOS version of *Fortnite* is a safe and secure payment system. (Ko Trial Tr. 804:18-806:10.)

a. The Payment Card Industry Data Security Standard (PCI-DSS) sets rigorous security requirements to prevent cardholder data loss as well as general requirements for the prevention, detection and

response to security incidents for all organizations accepting and/or processing payments. (Ko Trial Tr. 805:18-23.)

- b. Epic's eCommerce system is PCI-DSS-compliant, though Epic is not actually required to maintain compliance with the standard. (Ko Trial Tr. 805:23-806:10.)

547. Epic never stores customers' credit card numbers on its systems. (Ko Trial Tr. 803:19-22.)

- a. Epic's customers' payment details are stored with the payment service provider such as PayPal or Chase Payments. (Ko Trial Tr. 803:23-24.)

548. Any issues discovered are remediated with the appropriate teams and verified by Epic's security team. (*See* Ko Trial Tr. 820:5-7 (noting that there is an Information Security Services team that handles customer data privacy).)

549. Neither Epic nor Apple is aware of any security or privacy issues that resulted from the introduction of Epic direct payment into *Fortnite* on iOS. (Sweeney Trial Tr. 128:9-12; Fischer Trial Tr. 909:19-910:1; Schiller Trial Tr. 3108:20-24.)

Q. *Unreal Engine.*

550. First created in 1998, *Unreal Engine* is a software suite available to third-party developers to create three-dimensional and immersive digital content for use in games and other applications. (Sweeney Trial Tr. 116:18-22 ("The Unreal Engine is a development tool aimed at 3D content creators rather than consumers. It contains content creation tools, real-time

3D graphics, capabilities, and real-time physics and simulation technology that is used by a wide variety of industries to make a variety of 3D content.”).)

551. Epic also offers the *Unreal Engine* Marketplace, an e-commerce platform through which developers can create and sell art, animation, textures, and other assets to use with *Unreal Engine* projects. (DX-4002.8.)

552. Millions of developers use *Unreal Engine*. (Sweeney Trial Tr. 118:10-12 (“We’ve had more than 7 million users install the software over a lifetime, and we have roughly 500,000 monthly active users.”).) Hundreds of millions of users use apps built with the *Unreal Engine*. (Sweeney Trial Tr. 119:24-120:1.)

553. Popular videogames that rely on *Unreal Engine* include *Fortnite*, *PlayerUnknown’s Battlegrounds* (“PUBG”) and *Rocket League*, among others. (Sweeney Trial Tr. 118:13-18, 163:7.)

a. These games are played by hundreds of millions of people around the world. PUBG alone has hundreds of millions of users on Android and iOS mobile devices. (Sweeney Trial Tr. 119:15-17.)

554. *Unreal Engine* is used far beyond the realm of videogames.

a. Developers use *Unreal Engine* to make digital content for a wide range of commercial uses, including architecture projects, film and television production, medical training, fashion, and more.

(Sweeney Trial Tr. 116:19-22.)

555. *Unreal Engine* is uniquely valuable to developers given the breadth of its cross-platform capabilities. (Sweeney Trial Tr. 118:10-12 (“We’ve had more than 7 million users install [*Unreal Engine*] over a lifetime, and we have roughly 500,000 monthly active users.”), 117:21-22 (“*Unreal Engine* supports the creation of apps, which can run on at least eight different platforms.”).)

556. In 2010, Epic expanded *Unreal Engine*’s capabilities to support the iOS and Android platforms, allowing developers to offer their *Unreal*-powered applications on players’ smartphones and tablet devices. (Grant Trial Tr. 681:8-12.)

- a. Epic International distributes several free iOS apps that developers can use to assist with development using *Unreal Engine*. (See Section IX.M above.)
- b. Developers can use *Unreal Engine* to develop game and non-game apps alike for iOS. (Sweeney Trial Tr. 118:16-20 (“The list includes games such as PlayerUnknown’s Battlegrounds, Rocket League, literally thousands of other games. It also includes architectural creation apps built by third parties. It includes video production apps used in television production.”).) Epic may be entitled to a royalty for these apps. (Sweeney Trial Tr. 119:4-5, 9-12 (“We have a business model that enables anybody to download and begin using the *Unreal Engine* for free. And then

we have a variety of business terms under which users may distribute commercial products.”).)

557. Since 2010, Epic has continued to develop and expand *Unreal Engine*’s platform offerings. (Sweeney Trial Tr. 89:20-24.)

558. Today, developers can use *Unreal Engine* to develop games and other software for Windows PCs, PlayStation 4, PlayStation 5, Xbox One, Xbox Series X, Nintendo Switch, Mac computers, iOS mobile devices and Android OS mobile devices. (Sweeney Trial Tr. 117:21-22 (“*Unreal Engine* supports the creation of apps, which can run on at least eight different platforms.”); Grant Trial Tr. 681:8-12.)

559. Many game developers rely on engines like *Unreal Engine* to develop commercially successful games that will run across a wide range of platforms, and over many generations and new versions of the game. (Grant Trial Tr. 665:21-23 (“There is a large number of gaming apps [that rely on *Unreal Engine*]. We could look at things like PUBG, Batman, Days Gone, [Gears] of War. . . . I mean, there would be hundreds.”).) In addition, “[d]evelopers who wish to have sophisticated realtime graphics will often rely on *Unreal Engine* to provide those even though it may not be in a gaming context.” (Grant Trial Tr. 666:3-5.)

- a. An engine that cannot support Apple’s platforms, for example, would not be a viable option for any developer that wants to offer its software to the more than one billion active iOS and macOS users. (Grant Trial Tr. 671:11-18 (“All of the platforms you listed, they are only available to a subset of the users we might wish to

make apps available to. So, for example, on PC we have a version on *Unreal Engine* and that is great for users who have a PC, but if we wish it to be available to Mac users, we have to rewrite portions of *Unreal Engine* that use platform APIs for Mac. It's the only way we can access a hundred percent of [a platform's] users or at least have the option of accessing a hundred percent of that market. And that applies for game consoles, mobile devices, and personal computers.”.)

560. Open access to *Unreal Engine* is a core part of Epic's business philosophy.

- a. *Unreal Engine* is free to use for non-commercial purposes. Anyone can download *Unreal Engine* and learn to create their own projects. (Sweeney Trial Tr. 119:9-10 (“We have a business model that enables anybody to download and begin using the Unreal Engine for free.”); Grant Trial Tr. 681:3-7.)
- b. For developers who use *Unreal Engine* to develop and sell their games or other projects commercially, Epic typically collects a 5% royalty after the developer reaches \$1 million in gross sales. Developers then submit a royalty report and pay any royalties due to Epic on a quarterly basis. (Grant Trial Tr. 681:3-7; DX-4022.)

c. Alternatively, Epic has a variety of business terms under which users may distribute commercial products using *Unreal Engine*. (Sweeney Trial Tr. 119:9-12 (“We have a business model that enables anybody to download and begin using the *Unreal Engine* for free. And then we have a variety of business terms under which users may distribute commercial products using the *Unreal Engine*.”).)

561. This model of open access increases game output and competition among game developers, benefitting Apple and other platform makers by leading to the creation of more and higher quality apps for their platforms.

a. Apple has credited Epic and *Unreal Engine* for “introduc[ing] sever[al] breakthrough technologies” for game developers. (PX-43.2; Ex. Depo. 16 at 325:19-20, 326:1-5, 327:11-14 (Okamoto).)

562. For this reason, platform owners, including Apple do not charge for *Unreal Engine* to create software development tools for their platforms. Instead, they welcome and encourage the use of *Unreal Engine*.

a. For example, Apple has invited Epic engineers to travel to Apple’s campus to work on integrating new augmented reality functionality called ARKit into *Unreal Engine* for iOS developers to use. (PX-855; Ex. Depo. 18 at 361:23-25, 362:10-13 (Pruden).)

b. Epic was chosen to present this technology because Apple believed “it would allow developers using their engine to adopt new ARKit functionality”, which Apple could use for marketing new Apple devices “that support ARKit”. (Ex. Depo. 18 at 364:23-365:6, 365:8, 365:10-14, 365:16-17 (Pruden).)

563. In connection with Apple’s revocation of Epic’s Apple developer account, Apple has threatened to terminate all of Epic’s and Epic’s affiliates’ Apple Developer Program accounts and revoke Epic’s access to tools necessary to improve hardware and software performance of Unreal Engine on Mac and iOS hardware. (Sweeney Trial Tr. 97:17-19 (“Apple has threatened to remove Epic’s ability and access to its APIs to continue developing the *Unreal Engine* for iOS and Mac devices.”).)

a. Apple’s retaliation would disrupt and impede Epic’s ability to continue supporting *Unreal Engine* for Apple devices and for Epic’s engineers to continue providing support to developers working on iOS and macOS projects. (Sweeney Trial Tr. 97:20-23 (“[I]f we could no longer develop [*Unreal Engine*], then it would, you know, become obsolete relatively quickly and we couldn’t provide proper support to our customers, and our customers would no longer rely on us as the supplier of that software.”).)

b. The loss of *Unreal Engine*’s ability to support these important platforms would cause irreparable harm to Epic’s product

offerings, as many developers would select a competing engine for their new projects or for the next versions of their games.

(Sweeney Trial Tr. 97:20-23.)

- c. Third-party developers who rely on Epic's engine and support would be in jeopardy of losing the long-term support of Epic and its *Unreal Engine* tools for use in connection with Apple devices.

(Sweeney Trial Tr. 97:20-23.)

X. INTELLECTUAL PROPERTY JUSTIFICATIONS FOR APPLE'S RESTRAINTS ON APP DISTRIBUTION ARE PRETEXTUAL.

564. Apple contends that its restrictions on iOS app distribution have legitimate intellectual property ("IP") justifications. However, this Court can reject this justification as pretext if there is no evidence that Apple's restrictive conduct was actually motivated to protect its IP. (*See* Malackowski Trial Tr. 3699:25-3700:10.)

565. Apple has put forth no evidence demonstrating that its prohibition of the "stores within a store" model is tied to protecting its IP or to prevent free-riding on its IP. (Malackowski Trial Tr. 3692:18-21 ("Q. You have not offered any evidence or cited any evidence that demonstrates that the reason why Apple prohibits stores within a store was tied to protecting its IP; right? A. I think that's true."), 3693:18-22, 3694:11-13, 3695:25-3696:4.)

566. When asked directly for the business reasons that Apple decided that it would only distribute third-party native apps on its App Store, Mr. Schiller did not mention IP. (Schiller Trial Tr. 2738:15-24 ("Q. And what were the business reasons that Apple decided that it would only distribute third-party native apps on its App Store? A. Well, we've covered a number of the important reasons to us. Maintaining the quality of iPhone, maintaining the security and privacy of our users were all critical to the idea of opening it up for native apps. Q. And have those priorities for privacy, security, and reliability ever changed? A. No.").)

567. Apple's IP expert witness, James Malackowski, admitted that documents and testimony he reviewed confirmed that the specific costs of development of Apple's IP was not the basis for selecting the 30 percent commission for the App Store. (Malackowski Trial Tr. 3662:13-17.)

568. The DPLA, the agreement through which Apple purports to license its IP, is missing key features of typical IP licensing agreements.

- a. The DPLA does not list a single patent that it purports to license. (Malackowski Trial Tr. 3666:16-3667:6.) Mr. Malackowski testified that no one at Apple gave him a list of patents licensed by the DPLA and he's "not aware of any such list". (Malackowski Trial Tr. 3667:18-3668:7, 3668:10-18 (agreeing that, "generally speaking, licensing agreements should clearly define what is being licensed and the specific rights that the licensor is granting to the license[e]").)
- b. A developer examining the DPLA would have no way to ascertain what IP is licensed under the agreement. (Malackowski Trial Tr. 3669:22-3670:7.)
 - i. For example, Mr. Malackowski could not say if private APIs were licensed through the DPLA and did not even check to see if they were subject to IP protection. (Malackowski Trial Tr. 3670:24-3671:5.)
 - ii. Instead, it is "[o]nly through identification of the particular technologies at issue" can one know which IP is licensed, a process that is "not in the DPLA". (Malackowski Trial Tr. 3669:22-3670:7.)

- c. The DPLA does not refer to Apple's commission as a royalty and does not use the word "royalty". (Malackowski Trial Tr. 3697:12-18.)
- d. There is no temporal restraint in the DPLA regarding the length of time during which Apple should receive commissions. (Malackowski Trial Tr. 3699:3-5.)
- e. Schedule 2 specifically says that the commission is for Apple's services as agent; it's not for Apple's IP.
 - i. Section 1.1(c) of Schedule 2 states the term "Licensed Application" "shall include any content, functionality, extensions, stickers, or services offered in the software application." (PX-2943.1.)
 - ii. Section 1.1 makes Apple "Your agent [and/or commissionaire] for the marketing and delivery of the Licensed Applications to End-Users." (PX-2943.1.)
 - iii. The lead-in language to Section 3.4 states: "Apple shall be entitled to the following commissions in consideration **for its services as Your agent and/or commissionaire under this Schedule 2**". (PX-2943.3 (emphasis added).)
 - iv. Sections 3.4(a) and (b) then provide that Apple is entitled to a 30% commission "[f]or sales of Licensed Applications

to End-Users”, and 15% “for auto-renewing subscription purchases made by customers who have accrued greater than one year of paid subscription service within a Subscription Group”. (PX-2943.4.)

- f. The DPLA does not license a discrete set of IP rights; rather, it is about getting access to the iOS platform, which involves Apple’s IP, third-party IP, and technology that is not protected by any IP at all.
- g. The DPLA does not provide a license to Apple’s trademarks. (*See* PX-2619.12 (DPLA) § 2.6 (“This Agreement does not grant You any rights to use any trademarks, logos or service marks belonging to Apple”).)
 - i. Despite testifying that Apple has “approximately 1500 trademarks” related to iOS (Malackowski Trial Tr. 3622:5-7), Mr. Malackowski conceded that these trademarks are not necessarily licensed through the DPLA. He could not determine any trademarks licensed through the DPLA and did not “conduct an inventory of the subset of trademarks that were specifically licensed to developers”. (Malackowski Trial Tr. 3685:8 3687:15.)

569. Neither Apple nor Mr. Malackowski disaggregates the portions of Apple's IP that are: (i) protected versus not protected; (ii) proprietary versus non-proprietary; or (iii) at issue versus not at issue.

- a. Apple admits that it utilizes open source software in connection with its innovations (Schiller Trial Tr. 2939:18-2940 10; PX-1891; PX-1893), but Apple does not separate out this software from its IP. Indeed, Mr. Malackowski confirmed that open-source software was "obviously, utilized, as well, but [his] summaries are based only on the proprietary Apple IP." (Malackowski Trial Tr. 3619:17-23.) He made no qualitative distinction between the open-source portions versus the proprietary portions.
(Malackowski Trial Tr. 3689:20-23.)
- b. Mr. Malackowski acknowledged that Supreme Court precedent holds that not every piece of code or API software is protectable under the IP laws. (Malackowski Trial Tr. 3690:16-18, 3691:8-18.) Mr. Malackowski is aware, for example, that the protection of some code might be subject to the fair use doctrine. (Malackowski Trial Tr. 3690:10-3691:7.) Yet he did no analysis to determine whether any of the APIs that Apple has and may or may not license to developers are, in fact, subject to fair use. (Malackowski Trial Tr. 3691:24-3692:3.)

c. Mr. Malackowski thought it appropriate to include all IP, even IP associated with accessories, in his analysis even though the focus in this matter is on app distribution and iOS. (Malackowski Trial Tr. 3660:7-11.)

570. Mr. Malackowski lacks credibility, has provided inconsistent testimony, performed an incomplete R&D analysis, and used a patent search process prone to errors.

- a. Epic presented at least six different occasions on which courts have excluded Mr. Malackowski, either in whole or in part, based on a faulty analysis. (Malackowski Trial Tr. 3647:3-3657:14.)
 - i. In many of these cases Mr. Malackowski failed to properly apportion or disaggregate—a primary flaw in his analysis here. (Malackowski Trial Tr. 3647:3-3657:14.)
- b. Separately, Mr. Malackowski has provided inconsistent and confusing testimony in a number of areas.
 - i. For example, Mr. Malackowski testified that across “about a million” developers that have executed the DPLA, Apple has “been consistent” in the way it licenses its IP. (Malackowski Trial Tr. 3642:16-20.) Indeed, Apple boasts that the DPLA is non-negotiable and that all developers receive the same treatment. (*See, e.g.*, Schiller Trial Tr. 2757:4-5, 2760:6-8.) However, when it comes to

determining the specific IP that is licensed through the DPLA, Mr. Malackowski testified that it is variable, “depend[ing] upon the need of the developer”. (Malackowski Trial Tr. 3698:21-3699:2.)

ii. And because Malackowski’s “focus was [only] on Epic”—only one of thousands of iOS developers—he had not considered what IP rights would supposedly be licensed to other developers under the DPLA. (Malackowski Trial Tr. 3688:11-20, 3686:24-3687:5.)

c. Mr. Malackowski’s R&D analysis is misleading and incomplete.

i. For his R&D analysis, Mr. Malackowski simply totaled the amount Apple spent on R&D over the years and presented it in chart form. (Malackowski Trial Tr. 3612:19-3613:9.) Mr. Malackowski did not chart Apple’s R&D spend relative to its revenue, profits, market capitalization, total assets, or relative to any comparable companies.

(Malackowski Trial Tr. 3658:21-3659:12.)

ii. Moreover, Mr. Malackowski did not disaggregate Apple’s R&D expenditure to its various business lines (Malackowski Trial Tr. 3659:13-17), nor did he quantify the amount of Apple’s investment in IP assets specifically

associated with the App Store. (Malackowski Trial Tr. 3661:13-15.)

iii. Mr. Malackowski did not quantify the amount of Apple's investment in innovations that specifically relate to APIs (Malackowski Trial Tr. 3661:16-20) and presented no evidence of a dollar amount on any single piece or collection of its IP. (Malackowski Trial Tr. 3658:10-12.)

d. Although he claims to have quantitatively studied Apple's investments, Mr. Malackowski did not quantitatively study Apple's return, thus, presenting an incomplete analysis. (Malackowski Trial Tr. 3665:19-21.) This is true even though Mr. Malackowski agreed, that as "an integrated platform", Apple currently monetizes its IP across the entirety of its business, including "placing applications with customers", "selling devices" and "all that it does". (Malackowski Trial Tr. 3663:5-9.)

i. This monetization also includes Apple's profits on the sales of iOS devices, which are clearly part of Apple's return on its investment in the iOS ecosystem. (Malackowski Trial Tr. 3664:4-7.)

ii. This monetization includes developer fees, which, taken together across developers, "provide[] a return for

[Apple’s] business generally . . . , including [its] IP”.

(Malackowski Trial Tr. 3663:22-3664:3.)

- e. Mr. Malackowski’s patent search process is prone to errors.
 - i. As part of his analysis, Mr. Malackowski testified that Apple has approximately 3200 patents and patent applications relating to app distribution and development. (Malackowski Trial Tr. 3667:7-11.) To identify these patents, Mr. Malackowski used various search criteria and “manually reviewed” the patents to determine their relevance. (Malackowski Trial Tr. 3616:24-3617:3.) However, as explained below, Mr. Malackowski’s search was flawed.
 - ii. For example, using the term “app store”, Mr. Malackowski testified that he found “165 granted patents and 91 patent applications” that “*relate specifically* to the App Store”. (Malackowski Trial Tr. 3621:8-13 (emphasis added), *but see* 3673:6-13 (testifying that these patents and patent applications “relate to terms that include the App Store”)). Mr. Malackowski acknowledged his search could be overinclusive, and, as relevant here, he agreed that it was “technically possible” that a patent containing the word

- “App Store” (as the term used in a query) may actually have nothing to do with the App Store or even the DPLA. (Malackowski Trial Tr. 3675:5-10.)
- iii. By way of example, Mr. Malackowski included PX-1183 on this list of patents related to the App Store. (Malackowski Trial Tr. 3681:14-3682:8.) The patent’s sole reference to the App Store is as follows: “This App is publicly available in the Apple iOS App Store”. (PX-1183.12.) When asked if the patent relates specifically to the App Store, Mr. Malackowski attempted—and failed—to rectify the misfit by testifying that the patent relates to the *tools* that are made available to developers; *i.e.* not the App Store. (Malackowski Trial Tr. 3684:7-13.)
- iv. Similarly, PX-1182 is a design patent that had one reference to the App Store: “The App Store trademark on the bottom of the figures is the property of Apple, Inc.” (PX-1182.1.) When asked if the patent related specifically to the App Store, Mr. Malackowski could only say that it “relates to the iOS ecosystem in particular as it relates to the design and display of apps on the iPhone”.

(Malackowski Trial Tr. 3680:1-3681:12.) In other words, it was *not* specifically related to the App Store.

571. Separately, although Mr. Malackowski included the design patent in his analysis as related to the App Store, he repeated three times that this patent would generally *not* be used by any developer. (Malackowski Trial Tr. 3676:3-4 (“[G]enerally, the app developers are not using Apple’s design patents. Generally, those are used by Apple.”), 3677:15-16 (“So as a design patent, I would not expect it to be utilized by a developer.”), 3678:20-22 (“I don’t believe that [developers] would be utilizing this patent. This is a patent Apple would be utilizing as reflects a design on their phone.”).)

XI. SECURITY JUSTIFICATIONS FOR APPLE'S RESTRAINTS ON APP DISTRIBUTION ARE PRETEXTUAL.

572. iOS security is not provided by an app store. It is provided by a variety of on- and off-device security mechanisms each of which can be implemented *independent* of the official App Store. (*See* Section XI.E below.)

573. iOS was designed based on macOS; it inherited many of the core macOS architectural features and improved on some of them. Apple, and over a hundred million macOS users, consider the macOS system to be secure even while permitting users to download apps from sources other than Apple's official Mac App Store. (*See* Sections XI.A, D below.)

574. Apple's decision to depart from the macOS model by excluding third-party app distribution on iPhones was a commercial policy decision, not one driven by technical security considerations. (*See* Section XI.C below.)

575. The most important security protections for iOS devices are provided by iOS itself. This "on-device" security is independent of the app distribution channel. (*See* Section XI.E below.)

576. Importantly, even the "off-device" security layers established for iOS do not require the distribution of apps through a single centralized store. As the macOS Notarization model makes clear, and as Craig Federighi, Apple's Senior Vice President of Software Engineering, testified at trial, Apple is capable of separating the review and signing of apps, on the one hand, from the sale and distribution of apps to users on the other. (*See* Sections XI.C, D below.)

577. Apple's App Review process is cursory and provides minimal security benefits beyond the on-device security that is already provided by iOS. To the extent that App Review does increase security, it does so through automated mechanisms that Apple can employ for apps distributed by third parties (as it does for macOS) and that are replicable (and potentially could be improved upon) by parties other than Apple. (*See Sections XI.F-H below.*)

578. This is all evidenced by the fact that "rogue" third-party app stores have historically existed on iOS with no known adverse security ramifications. (*See Section Error! Reference source not found. above.*)

A. iOS Was Modeled on macOS and Inherited its Core Architectural Features.

579. macOS and iOS are built using the same OS "kernel". (Ex. Depo. 4 at 64:19-21 (Forstall); Mickens Trial Tr. 2596:8-9 ("It's because iOS and MacOS share the same kernel and a lot of their middleware."); Federighi Trial Tr. 3358:12-14.) The "kernel" is the part of an operating system that implements the most basic activities performed by the OS. (Mickens Trial Tr. 2594:16-22.) The kernel is "the lowest layer of the operating system" and "the ultimate determinant of what happens on the machine, what happens on the hardware". (Mickens Trial Tr. 2563:9-13.)

580. Scott Forstall, the top Apple executive tasked with the development of iOS,¹⁰ testified that the iPhone was "released with an operating system that[] [was] based on macOS X". (Ex. Depo. 4 at 64:19-21 (Forstall); PX-2756, at '20:50-21:00.)

¹⁰ Mr. Federighi confirmed that he was not employed at Apple from 1999-2009, and that when he returned to Apple in 2009 he worked on engineering macOS. (Federighi Trial Tr.

581. Mr. Forstall pushed for, and ultimately succeeded in, convincing Mr. Jobs and other Apple decisionmakers to use macOS X as the basis for the iPhone operating system. (Ex. Depo. 4 at 57:2-5, 64:19-21 (Forstall).)

582. Mr. Forstall testified that there were many advantages to using macOS as the base of iOS, including that Apple “built macOS X specifically to be a modern operating system” with “exactly the modern operating system facilities we would want to use in any project”. (Ex. Depo. 4 at 58:7-17 (Forstall).)

583. As a result, iOS and macOS share several core architectural features, including a number of macOS security features. (PX-2756, at '20:50-23:03; Ex. Depo. 4 at 64:19-21 (Forstall); Mickens Trial Tr. 2592:16-17 (“iOS and macOS share critical infrastructure, critical plumbing.”), 2594:16-25.)

a. As Mr. Forstall explained in a presentation to the public during an iPhone Software Roadmap Event in 2008, “macOS X is comprised of four architectural layers” and “to build the iPhone OS, we started by taking the bottom three layers of macOS X and moved them straight across, to form the basis of the iPhone OS.” (PX-2756, at '20:35-21:00.)

3436:2-13.) Therefore, he had “no firsthand knowledge” of the launch of the iPhone, the launch of the App Store or any security threat modeling. He agreed, however, that Mr. Forstall was in charge of security when iOS launched. (Federighi Trial Tr. 3437:4-3438:3.)

B. Apple Has Failed to Demonstrate that macOS and iOS Have a Meaningfully Different “Threat Model” in the Context of App Distribution.

584. Apple claims that iOS presents a different threat model than macOS, and that this nuance makes Apple’s App Review process critical to ensuring security on iOS. (Apple Opening Statement Trial Tr. 77:20-78:14.) For instance, Apple argues that there are more iPhones than Macs (Apple Opening Statement Trial Tr. 78:7-8), and that iPhone users are more prone to download apps than Mac or PC users (Federighi Trial Tr. 3362:9-11). These justifications are pretextual.

- a. *First*, Apple has not offered any studies or statistical evidence to support its claim about the number of apps that iOS users are prone to download vis-à-vis macOS users.
- b. *Second*, when developing the iPhone and the appropriate security model for the device, Apple was not aware (and Apple has not shown otherwise) that iPhones would achieve the level of sales that it has today. For example, in the first year alone, Apple “blew” through its “aggressive and public goal” of selling 10 million iPhones in the first calendar year. (DX-4192.001; Schiller Trial Tr. 2786:14-23.)
- c. *Third*, in evaluating the security implications of opening up third-party apps on iOS devices, Apple similarly had no idea that app downloads would be popular amongst users. (PX-2060.18 (“Mr. Jobs: [The number of 200 million downloads in the last 30 days]

says the App Store is much larger than we ever imagined . . . We didn't expect it to be this big."); Schiller Trial Tr. 2744:9-21 ("Q. Was it a risk for Apple to launch the App Store? A. A huge risk. Q. How so? A. Well, we're in the first year here of the iPhone . . . We're taking our hot, new product and putting something we have never done before on it, and we have no apps yet so we have no idea how this is going to do."))

585. Apple also claims that iOS has a heightened threat model because of certain hardware features (a camera, microphone and GPS hardware) that "follow[] users nearly everywhere they go". (Ex. Expert 11 (Rubin) ¶ 23.) However, Apple's technical expert, Dr. Aviel Rubin, concedes that macOS devices also have built-in cameras and microphones, and that Macs could also be used in a number of private moments. (Rubin Trial Tr. 3801:2-13, 3802:10-21.) Dr. Rubin admits that Macs can also detect the device's location to a general approximation. (Rubin Trial Tr. 3807:2-5.)

586. Apple further claims that iOS has a different threat model because iPhones hold highly sensitive personal information. Dr. Rubin admits that whether Macs store the same or similar information as iPhones would be a factor he would consider in comparing their respective threat models; he also concedes that he has not conducted any empirical study to compare the types of information that people keep on their iPhones versus Macs. (Rubin Trial Tr. 3803:14-24.)

587. Dr. Rubin further acknowledges that Apple users can sync information between their Macs and their iPhones, such as photos, calendar information, contact information, passwords and credit card information. (Rubin Trial Tr. 3804:1-23.) For information that Dr. Rubin considers to be “most sensitive”, namely biometric information such as “Touch ID” and “Face ID”, payment information used for Apple Pay, and device location history, he claims that such information cannot be synced; instead, this information is stored in a secure location on the device referred to as the Secure Enclave. (Rubin Trial Tr. 3805:7-3806:4; DX-5492.011.) However, Dr. Rubin concedes that some Mac computers sold today also offer Touch ID and Apple Pay, and also have a Secure Enclave that stores this same biometric information. (Rubin Trial Tr. 3806:8-3806:22; DX-5492.011.)

588. In summary, the reasons provided by Apple to distinguish the iOS and macOS threat models are pretextual and unsupported by any contemporaneous, pre-litigation documentation; instead, they are based entirely on self-serving testimony by Apple’s own witnesses and/or Dr. Rubin’s evaluations which can only be described as incomplete for its failure to account for similarities that are shared between iOS and macOS devices.

C. Apple’s Decision to Forbid Third-Party Distribution Outside the App Store Was a Policy Decision, Not a Security Requirement.

589. Apple’s desire to review apps for malware or other harmful content does *not* require those apps, after review, to be distributed exclusively through the App Store. When Apple permitted third-party developers to create apps for iOS, the decision to restrict third party app distribution to the App Store was a policy decision, not a security requirement. When Apple permitted third-party developers to create apps for iOS, Apple’s security team developed a model

that was predicated on Apple signing each piece of code that would ultimately run on an iPhone, but intentionally separated this signing process from app distribution. (PX-877.3.) In other words, apps were required to be sent to Apple for signing, but then could either be distributed through the App Store *or* sent back to the developer for distribution through other means. (PX-877.3.) The security team specifically acknowledged that the decision whether or not to allow third party distribution was one of “policy”, not of security. (PX-877.3.)

590. In 2007, Apple’s security team prepared an internal white paper to assess the implications of distributing third-party apps on the iOS platform. (PX-875.1; PX-877.1; Ex. Depo. 4 at 108:22-24, 109:12-23 (Forstall).) The white paper was titled “Third Party Applications on Mac OS X Embedded”, noting the fact that the iPhone OS was built on the basis of the then-existing Mac OS X operating system, and was provided to Mr. Forstall, among others. (*Id.*; Federighi Trial Tr. 3442:13-15 (“Q. And you understand that in this context, ‘macOS 10 embedded’ refers to the iPhone operating system? A. I believe it does.”).)

- a. The white paper introduced three pillars of iOS security: strict signing by Apple of all code, strict sandboxing of all apps, and a system of app-specific entitlements. (PX-877.2; Federighi Trial Tr. 3446:3-7; DX-5492.98-100.) Code signing allows Apple to identify the source of code, attribute it to a specific developer, and revoke an app’s ability to run on iOS devices should they be identified as unsafe. (PX-877.2; PX-5492.98; Federighi Trial Tr. 3451:11-3452:6.) “Sandboxing” restricts app access to the files of

any other apps and from making changes to the device. (DX-5492.100; Federighi Trial Tr. 3444:10-19.)

- b. The security team's white paper was a "technical document from a technical team . . . building the security infrastructure" that would allow Apple to securely open up the iPhone for third party applications. Importantly, the white paper explicitly contemplates the possibility of distribution outside the App Store, and assumes that "the technical infrastructure [they were] building w[ould] allow for other distribution mechanisms" beyond the App Store. (Ex. Depo. 4 at 129:8-24; 130:5-19 (Forstall).)
- c. For example, the white paper states that Apple "will distribute third party applications through the iTunes Music Store. However, our model will allow for third parties to distribute their own applications and for enterprise customers to deploy to their own devices". (PX-877.3; Ex. Depo. 4 at 125:12-15, 127:3-8, 129:8-18 (Forstall).)
- d. That same whitepaper goes on to state that "[s]igning does not imply a specific distribution method, and it's left as a policy decision as to whether Apple signed applications are posted to the online store or we allow developers to distribute on their own".

(PX-877.3; Ex. Depo. 4 at 130:22-131:7 (Forstall); Federighi Trial Tr. 3447:7-16.)

- e. The same white paper then contemplates several distribution scenarios, all of which separate the signing process—which is done by Apple—from the ultimate distribution of the app. For example, the paper discusses the distribution choices available to a “guy in his basement” or to a large developer such as Electronic Arts; in both cases, the security team contemplated that once the binary has been signed by Apple, the developer would then “get signed image and deploy as you wish”. (PX-877.6; Ex. Depo. 4 at 118:25-119:17, 119:19-24 (Forstall); Federighi Trial Tr. 3448:9-3449:9.)

591. The model contemplated by this white paper required Apple to be involved in signing all apps for use on iOS; but the *signing* of an app was separate from its *distribution*. (Federighi Trial Tr. 3449:5-9 (“Q. And so the model contemplated in this white paper requires Apple involvement in the form of signing, but separates that signing by Apple from distribution; correct? A. It has that option, envisions the possibility of that option.”).)

592. Code signing would allow Apple to “shut off the spigot” if it turned out that an app was misbehaving—regardless of whether the app was distributed through the App Store or not. (Federighi Trial Tr. 3451:19-3452:6 (“Q. And so what the team is saying here is that their model contemplates allowing Apple to so-called shut off the spigot if it turns out that an app is misbehaving; correct? A. I didn’t see it say ‘shut off the spigot.’ Is that your phrasing? ”).

Q. Those are my words. I'm just saying -- A. Oh, okay. Q. -- that's the idea that's contemplated here, that Apple can revoke -- A. Yeah. Q. -- the signature and, essentially, stop the distribution of an app if it goes bad; correct? A. That is -- that is one capability that signing provides.”.)

593. Thus, while Apple has the ability to review and sign apps, there is no technical requirement that those reviewed and signed apps be distributed through the Apple App Store, as Mr. Federighi acknowledged:

- Q. Sir, at the end of app review as it is currently constituted, Apple has a binary that is fully reviewed and vetted; correct?
- A. It's been through our review process, yes.
- Q. And it's fully reviewed and vetted by Apple; correct?
- A. What -- I don't know what 'fully' means, but it is reviewed according to our process, yes.
- Q. And then whether to send it to the App Store or back to the distributor is entirely Apple's choice; correct? That's a yes-or-no question. It's entirely Apple's choice; correct?
- A. Yes.

(Federighi Trial Tr. 3510:5-15.)

594. Even after the “policy” decision contemplated in the white paper was made, and the launch of the App Store and the SDKs were announced, Apple was still contemplating whether to allow for third party app distribution outside of the App Store. (PX-881.1 (May 17, 2008 email chain between S. Forstall and S. Jobs discussing alerts for when users run applications not distributed through the App Store for the first time); Ex. Depo. 10 at 178:12, 183:5-183:6, 183:16-18, 183:20 (Forstall).) In fact, the internal policy discussion continued

within Apple at least until late 2009. (PX-2316 (November 20, 2009 email chain between P. Schiller and S. Jobs with Mr. .Schiller stating that “[i]n the end it all really comes down to whether we will ever open up the iPhone for developers to distribute apps on their own, bypassing our store.).)

D. Apple Separates Notarization from Distribution on macOS, Creating a Secure Yet Open Distribution Model on macOS.

595. In macOS, Apple adopted an open distribution model where developers have the ability to choose whether to distribute their apps through the Mac App Store or, alternatively, have their apps scanned and “notarized” by Apple but then distributed by the developer through other means—a model that is very reminiscent of the model contemplated by the security team for use in iOS in the 2007 white paper. Notably, even though macOS is less strict than iOS in implementing some of the security pillars contemplated in the 2007 white papers—and is therefore less secure than iOS would be had Apple allowed third-party distribution on that platform—Apple still considers and touts macOS as a safe and secure platform, even for young schoolchildren. (Ex. Depo. 7 at 273:15-18, 274:02-274:04 (Okamoto); PX-741.1 (“We design Mac hardware and software with advanced technologies that work together to run apps more securely, protect your data, and help keep you safe on the web.”); PX-2882.).

596. From the beginning, the Mac device has been part of a generation of systems where users can expect to download software from any distribution channel. (Federighi Trial Tr. 3393: 10-13.)

597. Apple has successfully instituted a number of security features to help protect the macOS platform against malware—“software which deceives an end user as to its function”—and against viruses. (Ex. Depo. 6 at 57:20-58:9 (Friedman).) This protection extends to “app downloaded from the internet”, with Apple informing its customers that macOS security “consists of a number of overlapping layers”, which “ensure[s] that apps downloaded from the internet are free of known malware”. (DX-5492.103.) Further, MacOS “offers technologies to detect and remove malware, and offers additional protections designed to prevent untrusted apps from accessing user data.” (DX-5492.103.) In addition to these hardware protections, “[s]ervices from Apple such as Notarization and XProtect and MRT updates are designed to prevent malware installation and, when necessary, to provide for a quick and efficient detect-and respond process to block and remove any malware that may have at first avoided detection.” (DX-5492.103.)

598. On macOS, Apple provides users with information and choices to enable them to determine whether to install and run apps from alternative sources, and also provides security scanning and protections to apps that are not distributed through the Mac App Store. Apple notes to its users that they always “have the option to allow only software installed from the App Store”. (DX-5492.104.)

- a. *First*, apps can be downloaded and installed via the Apple-managed Mac App Store, which is in many ways analogous to the iOS App Store. In order to distribute apps in this fashion, a developer must register with Apple’s Developer Program, submit

their app to the Mac App Store’s app review process and agree to the terms and conditions of being listed on the store. (Mickens Trial Tr. 2589:18-2590:1; PX-2557 § 6.1.) Any user has “the option to run only signed and trusted apps from the App Store”. (DX-5492.103.) That same option would be open to users of iOS should Apple allow for third-party distribution on that platform, and a user choosing to do so would enjoy the same protections offered by the App Store today. (Federighi Trial Tr. 3457:21-3458:1.)

- b. *Second*, a developer that is registered with Apple’s Developer Program can submit its apps for “notarization” by Apple. The “notarization” model tracks the model contemplated by the security team in the 2007 white paper, namely one where the scanning and signing of the app by Apple is separate from distribution. (Federighi Trial Tr. 3463:9-3464:9.) As explained below, notarization involves an automated scan for malicious content conducted by Apple, and certain apps are also manually reviewed. At the end of the notarization process, Apple signs the app (or “notarizes” it) *and returns the signed binary to the developer for distribution by the developer itself or through a third party online store*. (Federighi Trial Tr. 3463:21-25.) When a user

attempts to download such an app, a macOS feature called Gatekeeper will confirm the app has been notarized by Apple. (Ex. Expert 5 (Mickens) ¶ 86; Mickens Trial Tr. 2599:5-13; DX-5492.104.)

- c. *Third*, a developer who chooses not to register with Apple's Developer Program can attempt to distribute unsigned, unnotarized apps through third-party app stores and websites. Importantly, such distribution is unlikely to appeal to general users, as Apple takes significant measures to deter general users from downloading and installing unsigned applications. (Federighi Trial Tr. 3482:12-15.) Should a macOS user attempt to open such an unsigned, unnotarized app, the Gatekeeper technology in macOS will prevent the user from installing or opening the app and display a warning screen. The user will then need to go through several steps to override this warning and install and open an unsigned, unnotarized app by overriding several of the user's security settings. (Mickens Trial Tr. 2592:1-9; DX-5492.103 ("Ultimately, macOS users are free to operate within the security model that makes sense for them—including running completely unsigned and untrusted code."); PX-2531.1.)

599. Ultimately, the “application security” on “macOS consists of a number of overlapping layers” that give its users choices, “the first of which is the option to run only signed and trusted apps from the [Mac] App Store” or, alternatively, to download either software that has been signed by the App Store or software notarized by Apple. (DX-5492.103-104.)

600. Six notable security features utilized on macOS include: (1) signatures and certificates; (2) notarizations; (3) Gatekeeper; (4) Sandboxing; (5) XProtect; and (6) Malware Removal Tool (MRT). Critically, *all* of these security features can be implemented on iOS with minimal engineering effort. (Federighi Trial Tr. 3473:2-4; Mickens Trial Tr. 2596:24-2597:7.)

601. *First*, signatures, or “code-signing”, are used in apps in order to ensure that an identifiable developer created the application and will vouch for its content.

- a. This enables attribution (verifying that only the person or entity identified as the developer could have produced the signature and therefore the app) and integrity (verifying that the binary has not been modified after the developer signed it). (Mickens Trial Tr. 2571:9-16; *see also* DX-5492.098-099.)
- b. Put differently, the signature process ensures that signed apps “haven’t been tampered [with] or altered”. (DX-5492.103.)
- c. Requiring code signatures enables Apple to stop distribution of an app if it is found to be malicious. (Federighi Trial Tr. 3451:19-3452: 6.)

602. *Second*, Apple's notarization process is an automated system that scans developers' software for malware known to Apple and generates a signed message if no such malware is found. (Ex. Expert 5 (Mickens) ¶ 86; Mickens Trial Tr. 2590:10-15; DX-5492.104.)

603. Beginning in macOS 10.15, all apps with an associated Developer ID must be either notarized by Apple or distributed through the App Store. (DX-5492.103.)

- a. If Apple's notarization service does not detect any issues with the app, then it returns a ticket for the developer to include with the app. (Ex. Expert 5 (Mickens) ¶ 86; Mickens Trial Tr. 2590:10-15; DX-5492.105.) Apple also publishes the ticket online in a location where its Gatekeeper program can locate it (*see below*). When a user downloads the app from a source outside of the Mac App Store, Gatekeeper checks the ticket to confirm that the app has been notarized. (Ex. Expert 5 (Mickens) ¶ 86; Mickens Trial Tr. 2599:3-13.) Any apps notarized by Apple are then able to run under the default Gatekeeper settings on Macs. (DX-5492.103.)
- b. A manual review is sometimes involved in the process of notarization. (PX-2557 § 5.3 ("Notarized Applications for macOS" states, among other things, that "in limited cases, a manual, technical investigation of [an] Application by Apple" for [security] purposes".).)

- c. Even after an app has been notarized, Apple can revoke a ticket for malware—and macOS regularly checks for revocation tickets to quickly block malware. (DX-5492.105; Rubin Trial Tr. 3794:14-3795:8.)
- d. Apple can also hold developers accountable by disabling the accounts of those developers associated with any malware. (Rubin Trial Tr. 3794:14-3795:8.)
- e. For example, when Apple learned that a notarized app distributed on macOS devices contained adware, Apple “revoked the identified variant, disabled the developer account, and revoked the associated certificates”. (Rubin Trial Tr. 3794:14-3795:8.)
- f. The notarization feature on macOS demonstrates that Apple is capable of reviewing and signing apps without requiring that those apps be distributed through an official Apple app store. (Federighi Trial Tr. 3464:1-5 (“Q. And so in notarization, there’s a separation between the scanning and notarizing that Apple performs and the distribution, which the developer can do in whichever way she wants; correct? A. Correct.”).)
- g. Finally, the scope and depth of the malware scans performed by Apple during notarization are determined entirely by Apple; Apple

could apply more comprehensive scanning if it believed it to be necessary or useful. (Federighi Trial Tr. 3464:23-3465:1.)

604. *Third*, Gatekeeper is a system that Apple introduced to block the installation of suspected malware on the Mac, and it “ensures that, by default, only trusted software runs on a user’s Mac”. (Federighi Trial Tr. 3471:6-14; DX-5492.104.)

- a. Gatekeeper assures that “when a user downloads and opens an app. . . from outside the App Store, Gatekeeper verifies that the software is from an identified developer, is notarized by Apple to be free of known malicious content, and hasn’t been altered”. (DX-5492.104.)
- b. And Gatekeeper, by default, further assures that “*all software in macOS is checked for known malicious content the first time it’s opened, regardless of how it arrived on the Mac.*” (DX-5492.104.)
- c. Gatekeeper also will be able to show if an application or plug-in installer is notarized by Apple, and will notify a user if something they are attempting to install was not signed with a developer certificate and notarized. (Mickens Trial Tr. 2599:3-18; Federighi Trial Tr. 3381:5-8 (explaining that “the app is notarized and . . . when the user subsequently downloads that software and tries to run it, the operating system will say, oh, look, this software has been notarized by Apple”).)

- d. Gatekeeper can be set to ensure that macOS users can only install and run apps from the Mac App Store, excluding even notarized software from other sources. (Federighi Trial Tr. 3472:1-5.) Thus, a parent can limit her child to purchasing apps only from the App Store by setting Gatekeeper to block all other apps. (*Id.*)
- e. One function of Gatekeeper is to make it difficult for a user to install unsigned code inadvertently or by mistake. (Federighi Trial Tr. 3482:12-18.)

605. *Fourth*, as noted above, sandboxing places software within a “container”, thereby restricting how it can interact with entities outside the container, such as the OS, the local hardware, and other apps. (Ex. Expert 5 (Mickens) ¶ 63; Federighi Trial Tr. 3375:11-13, 3375:20-22, 3375:23-3376:3 (explaining sandboxing as a mechanism that “contain[s] software to execute in the manner that the operating system is attempting to authorize”).)

- a. Sandboxing restricts apps from accessing files stored by other apps or from making changes to the device. This prevents apps from gathering or modifying information stored by other apps. (Ex. Expert 5 (Mickens) ¶¶ 26-28.) And if a third-party app needs to access information other than its own, it does so only by using services explicitly provided by the operating system. (Ex. Expert 5 (Mickens) ¶¶ 26-28; Mickens Trial Tr. 2570:22-24 (“A. So, yes, so that is the purpose of the sandbox layer. It is to restrict the types

of interaction that an application can have with the rest of the system.”); Kosmynka Trial Tr. 997:21-23 (“Q. In other words, [sandboxing] restricts apps from accessing files stored by other apps or making changes to the device, correct? A. Yes.”).)

- b. Notably, sandboxing is not strictly enforced on macOS. (Federighi Trial Tr. 3480:18-22.) By contrast, all apps on iOS must be sandboxed. (Federighi Trial Tr. 3481:8-12.) In that sense, iOS offers a more secure model than does macOS. (Federighi Trial Tr. 3481:16-19 (agreeing that “the developer community on iOS, unlike on macOS, is used to implementing complete sandboxing on all the apps that it writes”).) Apple could easily continue to enforce tight sandboxing in iOS were it required to allow third party distribution. (Federighi Trial Tr. 3481:20-23.)

606. *Fifth*, macOS has another device-level malware-scanning feature, called XProtect, which “checks, when a piece of software is run, whether it matches a set of known signatures for malware”. (Federighi Trial Tr. 3381:14-17; DX-5492.105.)

607. *Sixth*, Malware Removal Tool (MRT) is another macOS tool used for malware removal if any piece of malware has evaded the mechanisms noted above. (Federighi Trial Tr. 3394:9-15 (“We have another mechanism called MRT, the Malware Removal Tool. As we become aware of malware through our own scans, as well as from reports from third-party antivirus and security companies, we remove that malware. We block that malware and we

remove that malware.”).) MRT “remediates infections based on updates automatically delivered from Apple”, and “removes malware upon receiving updated information, and it continues to check for infections on restart and login”. (DX-5492.106.)

608. Some of these features, such as sandboxing and code signing, are already implemented on iOS. (DX-5492.098, .100.) All of the other features can be implemented on iOS with minimal engineering effort because iOS and macOS share the same kernel—the two platforms share much of the same plumbing to enable the same security protections. (Mickens Trial Tr. 2596:24-2597:7.) Dr. Rubin’s claim that malware scanning is untenable on iOS (Ex. Expert 11 (Rubin) ¶ 74) is belied by Mr. Federighi’s testimony that the reason why iOS has not implemented an on-device malware removal tool is simply because it has “never needed one” (Federighi Trial Tr. 3394:20-24) and that it is technically feasible to implement all of the security mechanisms that are currently in macOS (including its on-device malware scanning and removal features) on iOS. (Federighi Trial Tr. 3473:2-4.)

609. Apple disagrees that “it’s unsafe to use a Mac”, believing instead that “using a Mac is not insecure”. (Ex. Depo. 7 at 273:15-18, 274:2-4 (Okamoto).) Contrary to the litigation-driven trial testimony of Mr. Federighi (Federighi Trial Tr. 3389:21-25, 3390:1-8), Apple does not state, internally or externally, that macOS is less secure than iOS. (Ex. Depo. 7 at 279:7-9 (Okamoto); PX-741.1.)

610. Apple publicly touts the security of macOS, promising Mac users that they can enjoy “Security. Built right in.” (PX-741.1) and can “[d]ownload apps safely from the Mac App Store. And the internet” (PX-741.5.).

- a. Apple further ensures Mac users that “apps from *both the App Store and the internet* can be installed *worry-free*”, claiming that “[i]f there’s ever a problem with an app, Apple can quickly stop new installations and even block the app from launching again”. (PX-741.5 (emphasis added).)
- b. Apple has also claimed that it “design[s] Mac hardware and software with advanced technologies that work together to run apps more securely, protect your data, and help keep you safe on the web”. (PX-741.1.)
- c. Apple devotes an entire section of its Apple.com website touting the benefits of macOS for school children in kindergarten through twelfth grade. (*See* PX-2882.) Specifically, Apple uses those pages to market the Mac alongside the iOS-based iPad as ideal devices for use by schoolchildren. Nowhere in these pages does Apple raise security concerns or suggest that consumers seeking added security should purchase the iPad rather than a Mac. (PX-2882; Federighi Trial Tr. 3478:1-5 (“Q. But you agree with me that nothing in this page suggests that security is a vector that children or their parents or their schools should consider when choosing between a Mac and an iPad; correct? A. Not on these pages, no.”).)

611. Macs serve millions of Apple customers—there are over a hundred million active Macs currently in existence. (Federighi Trial Tr. 3473:16-19.)

612. Finally, Apple allows iPhones to synchronize data with macOS devices belonging to the same user, which implies that Apple is comfortable with the current security level on macOS devices. (Ex. Expert 5 (Mickens) ¶ 96; *see also* Section XI.B.)

613. Ultimately, the macOS model follows in many ways the model first laid out by Apple’s own security team back in 2007, for use in iOS. A similar model, with whatever additional scans Apple may deem fit, could be implemented by Apple for iOS. As Mr. Federighi acknowledged, just like the 2007 white paper contemplated, and just like the notarization process entails today, at the end of Apple’s current App Review process, Apple obtains a signed, fully-vetted app that is ready for distribution, and it is entirely Apple’s choice whether to send it for distribution through the App Store or instead send it back to the developer for distribution through other means. (Federighi Trial Tr. 3510:5-15.) That choice is the same “policy” choice noted by Apple’s security team back in 2007; it is not a choice guided by security considerations. (PX-877.3.

E. Security, Including for the iPhone, is Ensured First and Foremost by the OS and Hardware.

614. Most essential security functions for mobile devices are performed “on-device” by the OS. (Mickens Trial Tr. 2559:5-7.) This is because the OS is uniquely situated to see malicious behavior on mobile devices. (Mickens Trial Tr. 2565:6-10.) This security layer is independent of the app distribution channel.

615. There are a number of security features that iOS provides at the operating system level. (Mickens Trial Tr. 2557:9-12; Rubin Trial Tr. 3773:8-13.) These operating system-level protections are the most important security layers on a mobile device. (Mickens Trial Tr. 2559:5-12 (“Now in my opinion, it’s that middle layer of security mechanisms, the ones enforced by the on-device operating system that are the most important. And the reason is that the operating system is responsible for configuring or managing many of these security properties provided by the hardware level. And furthermore, there are security properties that the operating [sic] itself is really uniquely situated to provide.”).)

- a. These include features such as: (1) sandboxing; (2) address space layout randomization (ASLR); (3) W^X memory; and (4) secure booting. (Ex. Expert 5 (Mickens) ¶¶ 23-41.)

616. *First*, in order to enforce sandboxing, the OS only needs to know what kind of sandbox restrictions to apply to an app—which is “totally unrelated to the app review process.” (Ex. Expert 5 (Mickens) ¶ 68; Mickens Trial Tr. 2570:11-19 (“So if you look at how sandboxing works, sandboxing, and in fact, all of these security mechanisms, are agnostic as to the means by which an application gets on a device like a phone, for example. So even if there is, let’s say, a third party app store that delivers a malicious app, or in fact if there was a malicious app that comes through a first-party app store -- that does happen -- the OS can still sandbox that app and restrict the kind of damage that it can perform.”).)

a. According to Dr. Rubin, sandboxing “is one of the greatest contributions in recent computer security” and “has affected the lives of many people”. (Rubin Trial Tr. 3773:17-23.)

617. *Second*, “address space layout randomization (ASLR) thwarts attacks on memory secrecy. A memory secrecy attack tricks a process into revealing memory data to the attacker.” (Ex. Expert 5 (Mickens) ¶ 35; DX-5492.100.)

- a. Every computer application will have “instructions and data [loaded] into hardware called random access memory (RAM)”, which will then perform the desired application tasks. (Ex. Expert 5 (Mickens) ¶ 19.)
- b. ASLR makes it “harder for attackers to profitably exploit program bugs involving memory access.” (Ex. Expert 5 (Mickens) ¶ 35.)
- c. Modern OSs support ASLR. (Ex. Expert 5 (Mickens) ¶ 36.)

618. *Third*, “code integrity” protections, like write exclusive-or execute memory (W^X memory, also referred to as “Execute Never”), prohibit attackers from writing too much memory (which may allow attackers to get the program to execute code of their choosing) and do not allow new code to be written into a process. (Ex. Expert 5 (Mickens) ¶¶ 33-35; DX-5492.100.)

- a. W^X memory does this by conditionally designating each memory location as either writable or executable, but not both; this leads CPUs to refuse to execute instruction in memory locations marked

as writeable but non-executable, and to refuse to allow an update to a memory address that has been marked as executable but non-writeable. (Ex. Expert 5 (Mickens) ¶ 34.)

619. *Fourth*, secure booting “allows a computing device to detect if attackers have tampered with an OS” when the device is turned on. (Ex. Expert 5 (Mickens) ¶¶ 38-41; DX-5492.30.)

620. As a result of these security features—and primarily because of the tight sandboxing iOS enforces—iOS generally has no viruses. (Ex. Depo. 2 at 484:20-485:17 (Shoemaker).)

621. These OS-level security measures are all independent of the app review process. (Mickens Trial Tr. 2571:24-2572:5; Ex. Expert 5 (Mickens) ¶ 47.)

F. Apple’s App Review Is Cursory, Is Opaque and Yields Poor Results.

622. All apps commercially distributed on iOS undergo Apple’s App Review process. (Kosmynka Trial Tr. 877:9-12; Schiller Trial Tr. 2830:15-21.)

623. App Review provides minimal security benefits beyond the on-device security that is already provided by the iOS operating system. (Ex. Expert 5 (Mickens) ¶ 77.¹¹)

¹¹ Apple claims that Dr. Mickens did not have any direct evidence about the tools Apple uses for App Review and did not review any documentation about the training process for App Review. However, as Dr. Mickens testified at trial, security researchers in the field of mobile security are “oftentimes . . . asked to evaluate the security of a system that is partially or totally closed source.” In fact, “[t]he security community has designed a variety of techniques to allow sound analyses in the absence of information about closed source systems” and “[t]his is an accepted technique in the community”. Moreover, this practice of security researchers evaluating closed source systems is “accepted by Apple who runs a Bug Bounty Program . . . that

The security properties that the iOS operating system cannot enforce, such as legal compliance, are also difficult for App Review to screen for. (Ex. Expert 5 (Mickens) ¶ 77.) This is supported by evidence documenting the number of fraudulent, scam and copycat apps that have passed Apple's App Review process. (*See Sections XI.F, H.*)

624. Apple's App Review process involves both automated and manual screening. (Kosmynka Trial Tr. 992:11-15, 993:20-22, 994:13-15; 1099:4-5; 1102:18-21; Rubin Trial Tr. 3772:19-20, 3773:2-4.)

625. Apple's App Review process screens for both security and non-security issues. (*See e.g.*, Kosmynka Trial Tr. 994:13-15, 1089:14-24; Rubin Trial Tr. 3808:21-23 (“[S]ome of the App Review Guidelines have a primary focus on something other than security.”).)

- a. The majority of app rejections are for non-security issues. (*See, e.g.*, PX-300.6 (listing top 10 reasons for app rejection); DX-4374.007 (same).)
- b. Mr. Federighi, whose “job responsibilities cover the security of macOS and iOS” (Federighi Trial Tr. 3357:22-24), is not involved in the app review process (Federighi Trial Tr. 3484:7-18).

626. Apple does not recruit reviewers with sophisticated technical backgrounds. (Ex. Depo. 2 at 35:22-36:3; 37:24-38:7 (Shoemaker).)

allows outsiders, people who don't work for Apple[,] to analyze Apple's partially closed source software and hardware and find errors in it.” (Mickens Trial Tr. 2705:14-2706:5.)

- a. Historically, Apple has only required applicants to have familiarity with, but not expertise in, Apple's products and brand image. (Ex. Depo. 2 at 37:24-38:7 (Shoemaker).)
- b. When the App Store first began, applicants were considered qualified if they "understood how to use a Mac", "understood how to use an iPhone", "understood a little about the Apple brand", "could breathe . . . could think". (Ex. Depo. 2 at 35:22-36:3; 37:24-38:7 (Shoemaker).)

627. From its inception, the "guiding principle in App Review" is that it "review[s] . . . not test[s]" apps. (PX-140; Ex. Depo. 5 at 238:7-10, 239:5-8 (Haun).)

- a. "'Test[ing]' implies or outright infers that the individual providing [the] test has done a comprehensive use of the application, exercising most if not all of the functionality of an application, and not only testing all the functionality of the application, but [also] testing certainly much of the application under different conditions with . . . different data and by attempting to induce failure modes . . . and see[ing] how the application fares under a test like that." (Ex. Depo. 5 at 239:24-240:10 (Haun))
- b. The App Review team does not perform such "comprehensive test[s]". (Ex. Depo. 5 at 240:12-16 (Haun).)

628. When an app is assigned to a reviewer during App Review, the reviewer is provided certain information about the app that Apple tools have collected or that has been provided by the developer. (Kosmynka Trial Tr. 1095:19-22 (developers “submit an iOS package” when they submit their apps for review).)

- a. The reviewer will read the marketing text, screen shots, and video trailers that were provided with the app. (Ex. Depo. 13 at 43:19-44:2 (Haun).)
- b. The reviewer may scan the information provided by Apple’s automated tools and examine the application based on the results of that scanning. (Kosmynka Trial Tr. 1106:2-7 (human reviewers “inspect the metadata and the app history” and “orchestrate the installation and actual app review itself on these peripheral iOS devices and tvOS devices”).)

629. Because of Apple’s requirements that all apps on iOS be distributed exclusively through the App Store—and that all apps on the App Store undergo App Review—the volume of apps submitted does not permit robust review.

- a. There are approximately 100,000 average iOS App Store submissions per week that are reviewed by approximately 500 App Reviewers. (Kosmynka Trial Tr. 1083:12-15.)
- b. On average, App Reviewers spend six to twelve minutes reviewing an app. (Kosmynka Trial Tr. 1001:22-24.) Mr. Kosmynka stated

that the last time he reviewed an app, he did not spend more than five minutes. (Kosmynka Trial Tr. 1002:2-4.)

- c. App Reviewers typically review between 50 to 100 apps per day, and productivity is tracked internally. (PX-6; Kosmynka Trial Tr. 998:12-14.)
- d. In certain instances, reviewers took less than a minute to review apps. (PX-131.)
- e. The app review error rate was approximately 15%, resulting in at least 15,000 apps erroneously rejected or erroneously approved per week. (Ex. Depo. 2 at 134:8-10 (Shoemaker).)
- f. Apple has acknowledged that the volume of apps that need to be funneled through App Review presents a problem. (PX-335.5 (“Here’s the problem, the volume is immense and continues to grow. The complexity is insane . . . 155 countries and 910 different types rejections reasons today. They are looked at manually every time starting from scratch and by different people (inconsistent). And all of this results in an SLA longer than developers should expect and even worse creates a great deal of anxiety and ill will between Apple and developers.”).)
- g. App reviewers wrongfully reject apps because they test them incorrectly. For example, Down Dog has had its apps rejected

twice because Apple reviewers claimed that they were unable locate the app’s integrated Apple Health features. (Simon Trial Tr. 384:7-385:5.) After Down Dog inquired about the rejections, it became apparent that the reviewers could not locate the advertised Apple Health features because they were reviewing the app on iPads—forcing Down Dog to have to “explain to Apple’s own reviewers that Apple has decided not to support Apple Health on iPads”. (Simon Trial Tr. 384:17-385:5.) These arbitrary delays slowed the release of Down Dog’s updates. (Simon Trial Tr. 385:6-8; *see generally* Fischer Trial Tr. 888:14-889:4.)

- h. In an open distribution model where Apple is no longer the only party reviewing all iOS apps distributed on the platform, third parties could dedicate more time to review apps; third parties could also innovate and utilize different techniques for screening apps, all of which would improve security on the iOS platform.

630. App reviewers can also escalate certain submissions to the Executive Review Board (“ERB”). (Fischer Trial Tr. 876:22-877:2; Kosmynka Trial Tr. 983:25-984:3 (“There are escalations of apps to ERB . . . ”).) The ERB has a history of rejecting apps for pretextual reasons and prohibiting apps that are competitive with Apple’s own products.

- a. The ERB is a group of individuals who “set[] the policy for the App Store” and make the ultimate decisions as to what is or is not

allowed into the App Store. (Kosmynka Trial Tr. 983:23-984:3, 1013:22-1014:1 (“ERB sets policy and handles escalations for precedent-setting issues”); *see also* Fischer Trial Tr. 876:22-877:2.)

- b. The ERB also determines exceptions to policies or Guidelines. (Kosmynka Trial Tr. 1013:22-1014:1; Fischer Trial Tr. 877:3-8 (ERB “discusses potential changes to the App Review Guidelines” and “determines whether a different business model could be utilized within the App Store”).)
- c. “If there was anything that was truly major going on in the App Store, you would expect that the executives on the ERB would be made aware of the fact” (Fischer Trial Tr. 961:13-16.)
- d. Phil Schiller, Eddy Cue, Matt Fischer, Ron Okamoto, Trystan Kosmynka, C.K. Haun, Greg Joswiak, Ann Thai, Josh Shaffer, Sean Cameron and Scott Forstall have all been members of the ERB. (Ex. Depo. 20 at 114:6-8 (Shoemaker); Fischer Trial Tr. 876:4-10; PX-2333; PX-146.)
- e. Mr. Schiller and Mr. Cue have been on the ERB since the App Store was first launched, which is when the ERB came into existence. (Fischer Trial Tr. 875:20-23, 876:14-16 (Mr. Schiller

and Mr. Cue have been on the ERB at least since 2010); Schiller Trial Tr. 2832:16-24.)

- f. Mr. Schiller is considered the head of the ERB. (Fischer Trial Tr. 876:17-21.)
- g. “[I]n the beginning”, Mr. Schiller, Mr. Cue and Mr. Forstall “had veto power”, meaning that if they instructed others not to approve an app, that app would not be approved. (Ex. Depo. 20 at 113:15-20; 114:6-8 (Shoemaker).)
- h. “[C]ompeting apps sometimes faced issues at the ERB because of positions taken by” its leaders. (Ex. Depo. 2 at 490:21-24 (Shoemaker).)
- i. Such apps were delayed or rejected for “pretextual” reasons. For example, certain apps that may have competed with Apple’s apps or features, such as Google Voice, were “rejected on pretextual grounds”. (Ex. Depo. 2 at 76:6-77:2; 88:6-8 (Shoemaker).)
- j. ERB meeting notes also make clear that a priority was to prevent entry of “apps that replace” the App Store. (PX-111; Ex. Depo. 2 at 175:4-176:7 (Shoemaker).)
- k. In 2013, an app from the developer Big Fish was “remov[ed]” “immediately” because Mr. Schiller and Mr. Cue were “adamant” about its removal, despite Mr. Shoemaker’s “protest[s]” that there

was no clear justification for doing so under the App Store Review Guidelines. (PX-115.)

631. Apple also receives “inbound emails notifying Apple about issues with apps that are found by the public or third parties on the iOS App Store.” (Kosmynka Trial Tr. 1007:25-1008.3.) When a customer, developers or the press informed Apple about issues with apps, for a period of time Apple referred to that as “throwing an app under the bus”, or “the UTB process”. (Kosmynka Trial Tr. 1010:11-15, 1010:24-1011:11.) This process has since been renamed to “App Review Compliance”, or “ARC”. (Kosmynka Trial Tr. 1009:10-14; Kosmynka Trial Tr. 1121:1-2.)

632. As part of content moderation, Apple purports to review apps for fake “copycat” apps, or apps that may purport to be another trademarked app. (Kosmynka Trial Tr. 1089:14-24.) This has not succeeded. Apps that are “obvious rip off(s)” of other apps have made it through App Review multiple times.

- a. An app called “Temple Jump” that was “a rip off of a top selling game”, Temple Run, was approved for distribution on the App Store. (PX-60.1 (Phil Schiller: “Is no one reviewing these apps? Is no one minding the store?”))
- b. In January 2016, “a fake Minecraft app”, “passing itself off as a \$6.99 official sequel”, “reached the Top 5 in the US Paid charts with the press picking up on it”. Apple removed the app from the App Store, but three months later had “another fake Minecraft

Pocket Edition 2 live on the store”, which at the time was “currently No. 2 in the UK Paid iPad chart”. (PX-61.1-2.)

- c. In November of 2016, the CEO of Headspace emailed Apple to complain of “repeated egregious theft of our IP in the Apple App Store” from submissions of paid apps to the App Store “called ‘Headspace’ with imagery, description, branding etc[.] identical to ours”. The CEO complained that “[s]hockingly, Apple [is] approving these apps, and when the users buy the apps they are left with nothing but some scammy chat rooms in the background,” that this sequence of events has occurred “four separate times” in the span of a month, and that the CEO had “proof that consumers are confused by this because users have left negative comments on our social channels as a result”. (PX-364.3.)
- d. Copycat apps still make it through App Review. (Schiller Trial Tr. 3131:14-16.) For example, Minecraft, “a very popular building game”, has several copycat apps in the App Store, including apps titled “BoomCraft”, “Block Craft” and “MultiCraft”. (PX-1883.1-3.)

633. Apple also purports to review apps for “[o]bjectionable content”, which includes “overtly sexual or pornographic material”, as well as “illegal or reckless use of weapons and dangerous objects”. (PX-2790 § 1.1.)

- a. However, apps in violation of these Guidelines make it past app review, sometimes because an app reviewer can spend as little as “32 seconds” reviewing an app. (PX-131.1; Ex. Depo. 5 at 146:3-5 (Haun).)
- b. Pursuant to this 32-second review, a “school shooting game”—an app that described itself as providing “the newest high school terrorist attack where criminals have bombarded the compound and are making students hostages”— passed App Review a mere two weeks after the massacre at Stoneman Douglas High School in Parkland, Florida; this app and others like it were not removed until after a 14-year-old app developer alerted Apple to the fact they were listed in the App Store. (PX-131.1-3; Ex. Depo. 5 at 142:20-23, 143:7-13 (Haun).) In response to this, Mr. Kosmynka wrote, “I’m dumbfounded with how this could be missed.” (PX-131.1)
- c. Apple had not enforced certain controls, such as requiring developers to use an “ask to chat” feature for under-13 accounts. As a result, in 2020, Apple employees estimated that Apple is “the greatest platform for distributing child porn, etc.”, noting that “there is a lot of this in our ecosystem”. (PX-276.17-18; Ex. Depo. 6 at 100:14-15, 346:19-24, 347:6-11 (Friedman).)

d. There have been other instances of shooting games on the App Store, such as an app where the entire premise was shooting canons at protestors. (PX-2371; Kosmynka Trial Tr. 1173:18-24.)

634. Dr. Rubin claims that reviewing for objectionable content can contribute to security because such content, like pornography, is frequently associated with malware. (Ex. Expert 11 (Rubin) ¶ 21.) More generally, Apple contends that centralized distribution is necessary to prevent third-party app stores on EGS, such as itch.io, from offering sexually explicit or other pornographic sites for download (Apple Findings of Fact (May 19, 2021 submission) ¶ 118.2; *see also* [REDACTED]

[REDACTED] However, such claims are belied by the content on Apple's own App Store, where apps such as "Obedience: BDSM habit training" (PX-1937.3), apps purporting to allow users to browse for escorts (PX-1938.1-2), apps offering "Kink, Fetish & Fet Hookup Life" (PX-1939.1) and apps featuring pornography (PX-1940) and other sexual content (PX-1941) are available.

- a. Other apps within the App Store, such as Instagram, TikTok and Reddit also offer pornographic content within the app itself. (*See, e.g.*, PX-1895.3 (Instagram page listing "Pornhub"); *see also* PX-1894; PX-1949; PX-1948; PX-1947; PX-1950.)
- b. Apple also allows certain pornographic content to be monetized through in-app purchases on various apps hosted on the App Store.

(PX-1937; PX-1938; PX-1939; PX-1940; PX-1941; Schiller Trial Tr. 3003:3-3009:22.)

- c. Consumers can moderate such content through parental controls. (Schiller Trial Tr. 3016:3-5.) EGS offers this option to its users. (PX-1890.) And of course, Apple itself allows objectionable content on the phone through the Safari browser. Apple's concern with content it finds objectionable is not with its availability on the phone, but rather with its association *with Apple's own App Store*—a problem that simply will not exist with respect to third-party app stores. (PX-2316 (Mr. Schiller noting that App Review is necessary “as long as we have a store” because “we can’t just let anything on an app store that has Apple’s name on it”); Ex. Depo. 2 at 73:21-74:5 (Shoemaker) (noting Apple’s concern is with objectionable content that bears the imprimatur of Apple’s own store).)

635. The App Store Review Guidelines are often arbitrary and arguable. (PX-98.3; Ex. Depo. 2 at 69:20-70:3 (Shoemaker).)

- a. Third-party developers have complained to Apple that Apple’s apps are permitted to do things that third-party apps are not permitted to do on iOS. (Kosmynka Trial Tr. 1028:11-15.) One reason is that many first party apps are integrated into the

operating system as a feature of the iPhone and not subject to the App Review process. (Kosmynka Trial Tr. 1032:10-14.)

- b. Apple has failed to provide meaningful guidance concerning whether and how developers' apps and/or features could meet Apple's approval. (Simon Trial Tr. 383:14-384:12.)
- c. Match Group views the app review process as a hindrance, rather than a benefit. (Ex. Depo. 1 at 63:2-3, 63:5-7 (Ong).)
- d. Apple's inconsistent App Review process slows down innovation, and has forced Match Group to waste resources. (Ex. Depo. 1 at 65:15-17, 65:19-66:4 (Ong).)
- e. In Match Group's experience, the App Review process is inconsistent, and requires developers to spend development resources on apps and updates that were initially approved but are ultimately rejected. (Ex. Depo. 1 at 62:15-16; 62:18-63:1; 63:8-64:16; 65:1-14 (Ong).)
- f. “[O]ne person’s hatred of a product is going to make it so it’s never available in the App Store.” (Ex. Depo. 20 at 70:17-20 (Shoemaker).)
- g. Consequently, “developers read [the Guidelines] one way”, and spend time and money to build and submit an app, only to have

Apple reject it because it “interpret[s] that line [of the Guidelines] differently”. (Ex. Depo. 2 at 72:1-12 (Shoemaker).)

h. As a result, developers “complain about Apple’s criteria being unclear” “every day”. (Ex. Depo. 2 at 126:20-23 (Shoemaker).)

636. Relatedly, Apple maintains a “set of whitelisted developers” (PX-64.1), “who get to do things that other developers don’t get to do” (Fischer Trial Tr. 900:9-13).

637. In addition, the App Review team “always” carries a backlog in app submissions for review. (Kosmynka Trial Tr. 1002:5-7.)

a. Complaints regarding delays persist to the present. (Kosmynka Trial Tr. 1002:11-14 (“Q. [D]evelopers have complained to Apple about the length of time that it has taken for their apps to undergo [A]pp [R]eview, right?” A. Yes.”); Simon Trial Tr. 415:1-6.)

638. Epic and other developers have experienced harmful delays in Apple’s App Review process. (Grant Trial Tr. 728:25-730:7.)

a. The requirement that users run the same version of *Fortnite* is critical to enable cross-platform play. That combined with the regular release of new content and updates through new versions or builds make it vitally important that new builds launch on all platforms at the same time. (Grant Trial Tr. 729:22-730:4 (“[B]ecause *Fortnite* requires all users to have the same version of an app, we would pass app review, say, okay, great we are good to

go early in the morning of the release date, we would press the buttons on the Apple developer site and the Sony developer site to release the app. They would all go out to users, but users in iOS would not be able to get the new version of *Fortnite* which meant for a period of time they weren't able to play the game.”).)

- b. While on iOS, cross-platform launch required Epic to request that Apple expedite the review of new *Fortnite* builds, as Apple's review process lagged behind the review process on all other platforms. (Grant Trial Tr. 727:9-10, 729:22-730:4.)
- c. Apple understood that App Review could detrimentally affect Epic's goal of “aligning releases across all platforms”, as “[i]t can take hours . . . for App Review to even receive an app”. (PX-442.1; Schmid Trial Tr. 3339:23-3340:13.)
- d. On a handful of occasions, Epic also needed to submit expedited propagation requests because new *Fortnite* builds that had already been approved by Apple's review process were for some unknown reason not made available to users through the App Store in a timely manner. (Grant Trial Tr. 729:14-21, 730:5-7.)
- e. Apple's App Review could take up to 48 hours and, after that, propagation to users could take up to 24 hours, which was significantly slower than the seconds or minutes that it took

consoles to propagate *Fortnite* updates. (Schmid Trial Tr. 3341:16-3343:10.)

- f. Because of these propagation differences, Epic sometimes had to decide whether to offer the update across all platforms or wait for Apple. (Schmid Trial Tr. 3343:7-10.)

639. The delay in Apple's review process was not typically caused by any rigor in the manual review process itself. (Grant Trial Tr. 729:5-13.)

- a. Apple's developer portal would often show that new builds would be in review or waiting for review for days. (Grant Trial Tr. 727:2-3 ("[The app review process] . . . was very variable. It could be under an hour. It could be multiple business days.").)
- b. Once in review, however, the actual process would take as little as a few minutes. (Grant Trial Tr. 726:25-727:3; Kosmynka Trial Tr. 1001:17-24.)

G. Apple Has Historically Lagged Behind Other Platforms in the Use of Automated Tools for App Review.

640. Automated tools for app review are commercially available. (Kosmynka Trial Tr. 996:7-19, 997:4-14.)

641. Apple has historically lagged behind Google in its use of automated tools for App Review. (PX-137.1 (Mr. Shoemaker noting that Google has implemented a dynamic analyzer which "allows [G]oogle to keep the play store free of API abuse without involving people", while Apple uses only a "static analyzer that rejects apps at the door, but it only catches

the easy ones”; and that “[G]oogle tools do a very good job of analyzing the text in the marketing text . . . [that] help to speed up the review process”, while “iOS App Review has only rudimentary tools to handle [text analysis]”).

642. Around 2015, Apple recognized that Google used automated tools since launching its app store. (PX-137.)

- a. Google’s tools included dynamic analysis (as opposed to Apple’s then-static code analysis), automated text analysis (for “issues like bad words, misleading text, defamatory speech, etc.”), automated pornography screening, an automated “test harness” (a program that simulates running the program) and others. (PX-137.)
- b. Apple did not have these tools at the time. (PX-144; PX-146; Ex. Depo. 5 at 289:21-22; 291:16-20 (Haun).)
- c. Apple has since recognized the effectiveness of using automated tools from third party providers as part of App Review. (PX-2052; Kosmynka Trial Tr. 995:13-25, 996:3-19.)

643. SourceDNA is a company that used static analysis and API detection capabilities to detect thousands of compromised apps that Apple’s App Review failed to detect. (Kosmynka Trial Tr. 995:23-996:2 (“Q. It was a serious event, correct? A. It was a serious event . . .”); *id.* at 996:3-6 (“Q. You said that in this email that SourceDNA would have flagged that issue, right? A. It’s going to take a moment to review the email. Yes.”)).

- a. Unable to replicate SourceDNA's capabilities internally, Apple became interested in acquiring SourceDNA, and completed the acquisition in 2016. (PX-2052; Kosmynka Trial Tr. 996:7-12 ("Q. And, in fact, this email discusses acquiring or potentially acquiring SourceDNA to use their software to counteract threats in the future. A. Yes. Q. And Apple, in fact, did acquire SourceDNA in 2016? A. We did.").)
- b. SourceDNA "built technology at Apple, which is named App Transparency" and does a combination of static and dynamic analysis. (Kosmynka Trial Tr. 996:13-19; *see also* PX-465.)

H. App Review Does Not Ensure Security or Quality.

644. While claiming that Apple's App Review constitutes a "critical component" of the iOS security model (Ex. Expert 11 (Rubin) ¶ 35), Dr. Rubin concedes that he has not performed any empirical analysis of the security, privacy or reliability of apps that are actually distributed through the App Store. (Rubin Trial Tr. 3809:10-24.)

645. Empirically speaking, Apple's ability to detect malicious apps during the App Review process is limited. (Ex. Depo. 6 at 94:9-23 (Friedman).) Apple executives have acknowledged that the App Store has had "all kinds of security and privacy issues," including "apps in the store that have defrauded customers" or "that have potentially taken their data" (Ex. Depo. 3 at 169:1-4, 169:6-9 (Cue)), and that such customer claims have occurred since the beginning of the App Store. (Ex. Depo. 3 at 168:7-18 (Cue).)

646. For example, App Review has limited to no ability to detect attacks by “Jekyll” apps that alter their behavior after App Review. (PX-465; PX-146; Federighi Trial Tr. 3508:24-3509:4; PX-251.1 (Mr. Friedman describing App Review’s key performance indicator as “how many apps can we get through the pipe” and not “what exotic exploits can we detect”).).

647. Apple’s FEAR (Fraud Engineering Algorithms and Risk) team is responsible for detecting and deterring fraud and abuse in the App Store, and tasked with “preventing illicit distribution” on iOS, meaning “distribution outside of the App Store”. (Ex. Depo. 6 at 57:24-58:9; 59:10-59:19 (Friedman).) The leader of the FEAR team believed that App Review would not “accomplish anything that would deter a sophisticated attacker”. (PX-251.1; Ex. Depo. 6 at 94:9-19 (Friedman).)

- a. The FEAR team further believed that “App Review is bringing a plastic butter knife to a gun fight”, that the process amounts to “a wetware [*i.e.*, a human-led] rate limiting service and nothing more”, and that Apple had not invested sufficient resources to detect and prevent the abuse. (Ex. Depo. 6 at 82:22-83:3 (Friedman); PX-250.1; PX-251.)
- b. In late 2017, even after Apple had acquired certain automated tools, the FEAR team still estimated that App Review was more “like the pretty lady who greets you with a lei at the Hawaiian airport than the drug sniffing dog”. (PX-252.1; Ex. Depo. 6 at 100:7-15 (Friedman).) FEAR likened App Review to TSA

employees, “under pressure to move people through” and “not able to deflect sophisticated attackers”. (Ex. Depo. 6 at 97:20-98:9 (Friedman).) FEAR believed App Review is judged by, and therefore is focused on, “‘how my apps can we get through the pipe’ and not ‘what exotic exploits can we detect?’.” (PX-251.1.)

648. Numerous malicious apps have been approved by App Review. (Ex. Depo. 2 at 214:23-214:25 (Shoemaker).)

- a. Apple has been informed that “[t]here is an epidemic of fraudulent apps at the App Store that attempt to defraud users of large sums of money”. (Fischer Trial Tr. 839:3-15.) Mr. Fischer agrees that “there are several forms of fraud associated with some apps that had been listed in the App Store”, including “financial fraud”, “fraud relating to customer ratings”, and “fraud relating to customer reviews”. (Fischer Trial Tr. 892:15-893:4.)
- b. By 2018, fraud was having such “a big impact for both developers and consumers” on the App Store that Mr. Fischer asked an Apple employee to “take leadership regarding what’s going on with all forms of fraud on the App Store”. (PX-66.1; Fischer Trial Tr. 892:5-11.)
- c. In some cases, fraudulent apps evade Apple’s screening even after multiple rounds of App Review.

- d. For example, in 2017, Apple conducted a “case study” of an app fraudulently offering virus scanning. (PX-253.5; Ex. Depo. 6 at 115:5-6, 115:15-18 (Friedman).) After being rejected twice, the app was accepted because the reviewers did not know about the prior rejections. (PX-253.) When released on the App Store, the app began fraudulently and aggressively offering weekly renewing subscriptions to non-existent “virus scanning” services for \$99.99 through IAP. (PX-253.) Eventually the app became one of the “Top Grossing” apps in the App Store. (PX-253.8; Ex. Depo. 6 at 123:8-23 (Friedman).)
- e. In 2019, Apple was notified that a security firm called Wandera identified 17 apps on the App Store that fraudulently collected ad revenue through a “Trojan attack”, which allowed apps to continuously open web pages in the background or click links without any user interaction. (PX-2084.2.) Apple removed these apps after Wandera reported its findings, but the developers of one of the malicious apps, “EMI Calculator & Loan Planner”, resubmitted their app for review without removing the malicious behavior. (PX-2084.1.) Apple approved it again, later acknowledging it is “making critical errors” during App Review. (PX-2084.1.)

- f. Another user described an experience with a TouchID scam:

“[T]he app launched a pop-up asking, ‘Enable TouchID access to photos?’, I tapped ‘Yes’ and then it merely prompted me to place my finger on the home button. As soon as that happened, it darkened the screen’s brightness to zero (so hardly anything could be read) and an in-app notification to purchase premium membership (no description whatsoever about its content) for \$89.99 appeared. As the App Store purchases were Touch ID enabled, this authorized the transaction and I was charged \$89.99”.
(PX-372.1.)
- g. In January 2018, Apple received a slide deck summarizing how one app called “Ringtones Z Premium” and its “sister apps” were “reaping in hundreds of thousands of dollars a month from unwitting customers through fraudulent and misleading practices”.
(PX-2029.1.) Users had posted “dozens of complaints” in the app reviews, which Apple found to be “shocking”. (PX-2029.1.)
- h. In addition to monetary losses, fraudulent apps on the App Store could have other grave consequences. In early 2019, for example, Apple approved an app that claimed “to detect blood pressure using the camera from a finger tip”, a technology not available at the time. A customer complaint described the app as “highly

dangerous” as it could lead “users with high blood pressure to believ[e] that the blood pressure readings from the app are accurate”. (PX-371.1.) Apple ultimately determined that the app was “nonsense” and “should not be on the store”. (PX-371.1.)

- i. Various types of payment fraud occur in the App Store, including refund fraud—“when a customer buys and enjoys or resells the content and then requests a refund”. (Ex. Depo. 12 at 146:9-13 (Gray).) In addition, Apple is aware that apps can be used for money laundering purposes. (PX-63.1.) Developers also raised concerns to Apple regarding fraud. (PX-67.1.)
- j. These apps persist in spite of Apple’s efforts to remove such apps as part of App Store Improvements Initiative (“ASI”), which was started approximately five years ago. (PX-326.1; Kosmynka Trial Tr. 1135:10-11.) One year into this initiative, Apple “had removed 400,000 or more apps” from the App Store. (DX-4399.064; Kosmynka Trial Tr. 1137:19-24 (“Q. And so already one year in, Apple had removed 400,000 or more apps as part of the App Store Improvement Program? A. Yes. Q. And those were all apps that had made it through app review and were currently on the App Store? A. Yes.”); *see also* Schiller Trial Tr. 2847:22-24

(cumulatively, over 2 million apps have been removed pursuant to this program).)

k. Notwithstanding these efforts, the head of App Review testified that certain apps with objectionable content under Apple's Guidelines remain on the App Store, notwithstanding the fact that he became aware of them months earlier in his deposition. (PX-315, Kosmynka Trial Tr. 1176:10-22 ("Q. After your deposition, did you go back – back to the office, so to speak, and tell your team about these apps to look into them? A. We've recently looked into these apps, yes. Q. They are all still fine? A. I believe the Waffle, offensive, not safe for work [app] is a candidate for App Store cleanup . . .").)

649. Apple has not commissioned any studies that evaluate whether apps downloaded to devices through Apple's Enterprise Program—and that do not undergo App Review—are more or less secure than apps downloaded from the App Store. (Ex. Depo. 9 at 143:19-144:4, 144:6-7 (Fischer).)

650. Ultimately, App Review adds little if anything to security proper. As noted above, according to Mr. Federighi, apps can easily circumvent App Review security scanning by changing their behavior after the review has been completed, and there is simply "nothing that app review could do in advance to prevent this kind of attack". (Federighi Trial Tr. 3487:24-3488:21.) In fact, Mr. Federighi acknowledged that Apple's best way to fight such

attacks is by monitoring malicious behavior “in the wild”—on the devices of consumers—and then use the very same signature mechanism identified by the security team in the 2007 white paper to block such apps. (Federighi Trial Tr. 3487:24-3488:21.) That process, as noted in the white paper, can be done regardless of the method of distributing the app. (PX-877.2-3.)

I. Even if Apple Ended Its Prohibition on Third-Party Distribution, App Review’s Security Protections Could Be Maintained by Apple or Replicated by Third Parties.

651. As noted above, neither iOS’s on-device security features nor its off-device security features require iOS apps to be distributed through the App Store. iOS’s on-device security features are enforced primarily through its operating system, and are agnostic to the issue of how a particular app arrived on a particular phone. (*See* Section X.E.) Apple’s off-device security features consist primarily of App Review and code signing. But, as Mr. Federighi acknowledged, once an app has been reviewed and signed by Apple, there is no technical requirement that it be distributed exclusively through the App Store. (*See* Section X.D; *see also* Federighi Trial Tr. 3510:5-15 (acknowledging that once an app has been vetted and signed by Apple, the question of whether to send it back to the developer for distribution or whether to distribute it through the App Store “is entirely Apple’s choice”)).

652. As discussed above and below, Apple can implement security features on iOS without restricting app distribution to the App Store. (Ex. Expert 5 (Mickens) ¶ 90-93.) Mr. Federighi testified that at the end of App Review, it is entirely Apple’s choice whether to send the reviewed app to the App Store or back to the distributor. (Federighi Trial Tr. 3510:12-15.)

- a. The success of security on the macOS demonstrates that Apple can achieve a secure product without restricting app distribution exclusively to the App Store. (Mickens Trial Tr. 2591:14-16 (“Q. Is iOS more secure than Mac OS? A. I would not say it is meaningfully more secure”), 2604:3-6 (“Q. Professor Mickens, would implementing any of these alternative distribution channels on iOS make the iPhone any less secure than the Mac OS, in your opinion? A. I don’t believe so, no.”).) As noted above, iOS already has stricter sandboxing, suggesting it would be even more secure than macOS if it were opened up for third party distribution.
- b. “There are a variety of different application [distribution] models which . . . allow for various degrees of Apple to have editorial control or the ability to implement malware scanning.” (Mickens Trial Tr. 2704:22-25.) And as noted above, one such model was recommended by Apple’s own security team back in 2007. (PX-877.)

653. In addition to the system-level protections already built into iOS, Apple could also implement the same security features it uses on the Mac to further secure iOS. (Mickens Trial Tr. 2588:20-24, 2597:1-7 (“So if we go to the next demonstrative, what we show here are some of the features that are currently unique to Mac OS -- (Demonstrative published.) THE WITNESS: -- although I believe that they could be implemented on iOS with minimal

engineering effort because there's so much shared plumbing between the two platforms.”), 2598:6-14 (“So if we look at this demonstrative, what it's showing is that on the left, I believe that you could actually take these models and move them to the iOS. And so if you look at that green part, at the bottom, you see that there are components that are on macOS, like Gatekeeper, like malware scanners, like the Notarization, that I'm showing sort of having these arrows coming to preexisting green parts, those are the pieces of technical plumbing that I think would allow those features from Mac OS to be brought over to iOS.”).)

654. Apple’s signature process for macOS applications is already substantially similar to the process used for iOS. (Ex. Depo. 5 at 25:1-6 (Haun).)

655. Apple could also use a notarization system in iOS as it does in macOS. (Ex. Depo. 5 at 37:5-13 (Haun); Mickens Trial Tr. 2598:6-14 (“[T]here are components that are on Mac OS . . . like the Notarization, that I'm showing sort of having these arrows coming to preexisting green parts, those are the pieces of technical plumbing that I think would allow those features from Mac OS to be brought over to iOS.”).) And if Apple truly believed that additional scans are necessary for iOS that are not currently implemented as part of notarization, Apple could implement such additional scans; “the scope and depth” of the scans performed by Apple during notarization are entirely Apple’s choice. (Federighi Trial Tr. 3464:23-3465:1.)

656. In addition, third parties can also perform app review. (Ex. Depo. 2 at 204:2-204:10 (Shoemaker) (“Q: Was there anything about the App Review process that was not susceptible to replication by another App Store should another App Store decide to do it? A:

No, I don't think so."); Kosmynka Trial Tr. 996:7-19, 997:4-14, 1187:21-1188:11; Rubin Trial Tr. 3811:24-3812:3, 3812:15-19.)

657. Apple's App Review is comprised of automated and manual reviews. (Rubin Trial Tr. 3811:17-22.)

658. The automated portion of App Review includes static and dynamic analyses, which are common techniques in computer security. (Rubin Trial Tr. 3811:24-3812:3 ("Q: Let's talk about the automated portion of app review now. That includes static and dynamic analysis, right? A. Right. Q: Those are common techniques in computer security, right? A: Yes.").)

- a. Static analysis looks at the code of the app and searches for patterns or instructions in order to determine what the app may or may not do. (Kosmynka Trial Tr. 994:1-7.)
- b. Dynamic analysis executes the code, or runs the app, as if the operating system would run the app to understand and observe how it would act in real life. (Kosmynka Trial Tr. 994:8-12.)
- c. Apple scans for malware using automated tools, including static and dynamic analyzers. (Kosmynka Trial Tr. 994:13-21.)

659. Static and dynamic analyses have an enormous impact on the security of a system; however, they are negligible in terms of time and cost needed to use them. (Rubin Trial Tr. 3812:7-13.)

660. There are third parties that build similar tools and focus on similar problems as Apple's App Review process. In fact, Apple has acquired such third parties in the past, such as Source DNA. (Kosmynka Trial Tr. 996:3-12, 996:20-23.) Mr. Kosmynka testified that at the time Apple acquired Source DNA, it had developed functionality that Apple did not yet have. (Kosmynka Trial Tr. 1187:25-118:11)

661. Third parties could also perform a manual review. (Rubin Trial Tr. 3812:15-19 ("Q. With respect to manual review, other app stores could implement a manual review, right? A. They can't do Apple's but they could do one. Q. Okay. They could do a manual review. A. Yes.").)

662. Apple has no evidence that App Review screens for security issues better than other methods of app distribution. (Kosmynka Trial Tr. 1187:25-118:11 ("Q. Is there anybody out there who is doing it better or differently than Apple? A. I couldn't comment on better, but certainly there's companies that do things differently all the time. And I can't, I guess, presume how they are doing it. But I can say from my own experience, Your Honor, with the *[sic]* SourceDNA and AppThority, when we were looking to acquire those potential companies, there was an element of what they were doing that we were not doing yet."); Fischer Trial Tr. 851:12-21.)

663. Apple uses human review and automated tools to perform a variety of steps that screen for security-related properties during App Review, including (1) SDK version compliance; (2) private API usage; (3) malware screening; (4) access to entitlements; (5) user consent for private data access; and (6) bandwidth testing.

664. *First*, Apple automatically scans each app to ensure that it meets Apple's standards regarding the use of up-to-date SDK versions. (Kosmynka Trial Tr. 993:11-13 ("Q. So part of the process, the automated process screens for out-of-date SDKs? A. Yes.").)

- a. "App [R]eview does not perform tests for sandbox compliance in all cases" and "performs such tests only when there is a reason to suspect that an app has done something to maliciously try to escape that sandbox". (Kosmynka Trial Tr. 997:24-998:5.)
- b. Apple's requirements for a minimum SDK version are published on its website and can be verified by third-parties. (Kosmynka 992:24-993:1 (Q. And so to that end, Apple publishes on its website its requirements for SDK versions, right? A. Yes."), , 996:7-12.)

665. *Second*, Apple uses automated tools to screen apps for usage of private APIs. (Kosmynka Trial Tr. 993:20-22 ("Q. When apps get uploaded to the app review process, Apple scans using automated tools for private APIs, correct? A. Yes.").)

- a. To screen for usage of private APIs, Apple uses both static and dynamic analyzers (PX-137; Ex. Depo. 13 at 206:20-21, 207:3-5 (Haun); Kosmynka Trial Tr. 993:23-25 ("Q. And to scan for those private APIs, Apple does both the combination of static and dynamic analysis; is that right? A. That's right.").)

- b. A static analyzer is a program that flags violations of simply syntactic rules in binary code, meaning that they compare the content of app binaries to a set of syntactic rules or strings.
(Kosmynka Trial Tr. 994:1-7.)
- c. A dynamic analyzer is a program that executes a program and monitors the execution to detect vulnerabilities, such as unauthorized use of Apple's private APIs. (Kosmynka Trial Tr. 994:8-12.)
- d. Third-party static analyzers have been created and are publicly available. (Kosmynka Trial Tr. 996:13-19, 997:7-14.)
- e. They have also already been built for iOS, including by Source DNA. (Kosmynka Trial Tr. 996:13-19.)
- f. In addition to SourceDNA, which Apple acquired and already uses, there are several other third-party companies that perform static and dynamic analysis for iOS, including Data Theorem and AppThority. (Kosmynka Trial Tr. 997:4-14.)
- g. In 2015, XcodeGhost malware “fooled [Apple’s] tool chain into including an inaccurate modified version of some SDK” into apps developed using Apple’s XCode developer software. (PX-144; Ex. Depo. 5 at 289:21-22, 290:11-291:7, 291:16-20 (Haun).) XcodeGhost malware impacted “128 million customers based on

the 2500+ apps”. (PX-2197.2; Fischer Trial Tr. 896:2-8.) At the time, SourceDNA used static analysis and API detection capabilities to detect compromised apps that Apple’s App Review failed to detect. (PX-2052.1.)

666. *Third*, Apple screens for malware using both human and automated tools.

- a. Human review consists of easily replicable “common sense” checks. (Kosmynka Trial Tr. 1103:8-11 (“[I]f the [HealthKit] entitlement is present in an app that is conceptually likely not doing good things with HealthKit, this could be a signal to [Apple] that there’s potential abuse in the future.”).)
- b. Third party commercial tools to detect malware exist, such as Norton iAntivirus and ClamXAV, and Apple uses these tools. (Ex. Depo. 2 at 452:21-25 (Shoemaker).)
- c. Third parties can also create static analyzers to detect malware. (PX-2052.1.)

667. *Fourth*, Apple checks to confirm that the entitlements used by a particular app are appropriate under the circumstances. (Kosmynka Trial Tr. 1102:14-21 (“[A]n entitlement gives an app a particular permission to a set of resources or APIs . . . on the user’s device. Q. And is there a look for potential entitlement issues during the static and dynamic analysis phase? A. Yeah. In both, and then in the human review phase as well.”).) For example, “[a]n app reviewer can . . . look at the purpose of [an] app and the entitlements the

author is asking for and say why is this calculator asking for permission to ask for health information". (Federighi Trial Tr. 3386:20-23.) This sort of common sense analysis can readily be replicated by third-parties, and Apple can identify no evidence in the record to the contrary.

668. *Fifth*, app reviewers consider an app's supplementary documentation such as privacy policies, to review user consent for private data access. (Ex. Depo. 13 at 44:10-12 (Haun).) Here again, Apple has adduced no evidence at trial in any way suggesting that third parties would somehow lack the ability to conduct such a review.

669. *Sixth*, [REDACTED]
[REDACTED]. (PX-101.241-245.) Here again, Apple has adduced no evidence at trial in any way suggesting that third parties would somehow lack the ability to conduct such a review.

670. Third parties can also screen for non-security properties, such as content moderation and quality assurance, and Apple has not demonstrated otherwise. (Mickens Trial Tr. 2696:25-2697:4. ("Q. Professor Mickens, is content moderation something that third parties are capable of doing outside of the iOS app store? A. I believe that it is and you do see that on other third-party app stores in some cases.").) Indeed, at trial Steve Allison, Vice President and General Manager of the Epic Games Store, testified that the EGS prohibits objectionable content on its store and conducts automated screening for pornographic imagery. (Allison Trial Tr. 1227:19-1228:2 ("Q. Does the Epic Games Store permit objectionable content on the store? A. No. Q. How does the Epic Games Store ensure that objectionable content does not make it onto the store? A. Part of the malicious software scan is looking for using AI pornographic imagery.

In addition to that, if we had any complaints, our moderation team, which is part of the InfoSec team, would be reactive and doing takedowns.”).)

671. Apple is already comfortable outsourcing the role of content moderation to third-party developers. (Federighi Trial Tr. 3469:16-340:1.) Mr. Federighi acknowledged that there is nothing that would prevent Apple from requiring third-party stores to perform their own content moderation. (Federighi Trial Tr. 3470:5-8.) Furthermore, even if Apple opened up app distribution on iOS, Apple will continue to control the on-device operating system, meaning that “Apple, if it so desired, could fundamentally turn off the spigot . . . on a particular piece of obviously objectionable content”. (Mickens Trial Tr. 2697:22-2698:12.)

672. Third-party app stores could also take steps to “educate people about what steps they were taking to protect people”, including publishing statistics about the number of bad apps they distribute compared to others. (Rubin Trial Tr. 3818:1-10.)

673. Third party app stores on iOS would not lead to an increase in pornographic or objectionable content not already allowed on the iPhone. While Apple claims the prohibition on alternative app stores ensures that objectionable content does not seep onto the iPhone, this content is already readily available to consumers. For example, consumers may access pornography through the Safari browser or apps already distributed through the App Store, such as Facebook. (Evans Trial Tr. 2418:14-2419:1; PX-1940; Schiller Trial Tr. 3007:11-3008:4.).)

674. If some objectionable content did make its way onto an iOS device, Apple has technical tools to facilitate the removal of such content. (Mickens Trial Tr. 2697:22-2698:12.)

675. Apple also touts other measures, such as a recently introduced privacy nutrition label concept, which Apple argues evidences its strong stance on privacy. However, Apple's nutrition labels simply ask developers to describe certain data policies, which is "fundamentally a representation from the developer, not a representation from Apple"; and Apple does not take any steps to verify these labels for their accuracy or completeness. (Federighi Trial Tr. 3507:19-3508:4; PX-1220.)

676. More broadly, despite Apple's assertion that Apple has a unique ability to safeguard privacy, Apple's "record [on privacy] is not perfect" (Cook Trial Tr. 3939:2-4.) For example, Apple stores data of Chinese users with a Chinese state-owned entity (PX-1678, Cook Trial Tr. 3944:5-12), and collects information about user searches, views, and downloads. (DX-4400.1, Cook Trial Tr. 3940:21-3941:2; PX-1978.6-12.) Moreover, only two to three percent of the total number of app rejections are for privacy guideline violations, which can include administrative missteps such as a failure to include a link to their privacy policy (as opposed to, for example, an app that is trying to maliciously steal private user data). (Kosmynka Trial Tr. 1142:14-21, 1143:17-1144:4.)

677. If permitted on iOS, competing app stores could be more protective of users such as by choosing not to collect information about what content a user searches for and the content that users view and download. (Cook Trial Tr. 3941:22-3942:3.) For instance, when

evaluating whether to make *Fortnite* available in Vietnam, Epic has refused to “take actions [that would] violat[e] the basic human rights of [its] users and [which] would impose censorship” (PX-1667.1).

678. Third-party app stores, like the EGS, take security seriously and have taken measures to protect users on the platform. (Allison Trial Tr. 1229:22-23.)

- a. For instance, Epic validates user accounts by using technologies like Captcha which are designed to prevent bots from getting through onto the platform. Epic also provides users with an option for multi-factor authentication for added security. Epic also has an InfoSec team, it’s information security team, that looks after the EGS ecosystem security. The InfoSec team is in “defensive mode all the time, monitoring the ecosystem for unusual transactional activity”. (Allison Trial Tr. 1225:8-1226:7.)
- b. Epic also provides parent control settings which allow parents to set up a pin-based system to block out other users from purchasing games or accessing certain content. (Allison Trial Tr. 1226:20-1227:1.)
- c. In order to protect consumers from harmful, malicious software, every app or app update that is uploaded to the EGS is run through a malicious software virus scan. (Allison Trial Tr. 1227:2-8.) This includes looking for objectionable content, including pornographic

imagery. Furthermore, if upon receiving complaints about objectionable content on its platform, Epic engages in takedowns. (Allison Trial Tr. 1227:19-1228:2.)

d. Mr. Allison of Epic testified that he is not aware of any known instances of malware or digitally-pirated content appearing on the EGS. (Allison Trial Tr. 1228:3-8.)

J. iOS Already Natively Supports Direct Downloading of Unreviewed Third-Party Apps Through the Enterprise and Ad Hoc Distribution Programs.

679. The existence of the Enterprise Program and Ad Hoc distribution channels today further demonstrate that iOS is technically capable of supporting third-party distribution models. (Mickens Trial Tr. 2585:25-2586:6, 2586:10-12, 2587:10-16 (describing Ad Hoc distribution), 2587:21-22, 2588:1-4, 2588:11-22.)

680. Apple allows some controlled direct downloading of third-party apps onto the iPhone through the Enterprise Program. (Sweeney Trial Tr. 147:19-23 (“The Apple Enterprise Program is an Apple program enabling corporations to develop software for iOS and to distribute their iOS software directly to their employees . . .”); Mickens Trial Tr. 2586:16-22 (“[T]he basic idea is that the enterprise first has to go Apple and has to register with the Enterprise Program. If Apple agrees to let the enterprise into the program, then the enterprise can then allow its own internal developers to create apps, to sign apps, and these apps are going to be signed by the enterprise developers, not by Apple. That’s a difference between this program and the app store program.”); Schiller Trial Tr. 3131:2-11 (the Enterprise Program

allows “third-party downloads directly on to an iPhone” and “doesn’t require going through the App Store”.)

681. When a developer enrolls in the enterprise developer program, Apple permits it to generate certificates and distribute apps outside the iOS App Store using those certificates. (Ex. Expert 5 (Mickens) ¶¶ 57-58.)

- a. The Vice President of the App Store, Matt Fischer, testified that he is not “aware of any studies within Apple that have looked at any security issues created on an iOS device[] as a result of the download of an enterprise app”. (Ex. Depo. 9 at 143:19-23 (Fischer).)
- b. Mr. Fischer also testified that he is not “aware of any instance . . . [where] any enterprise app downloaded on to an iPhone has created a security issue beyond a single iPhone”. (Ex. Depo. 9 at 143:24-144:4, 144:6-7 (Fischer).)
- c. Similarly, Mr. Schiller testified that he was “not aware of any exact security issues” arising from direct download of enterprise apps. (Schiller Trial Tr. 3131:15-21.)

682. The significance of the Enterprise Program is that “iPhone[s] already possess[] the ability to decouple the downloading of an app from the Apple-operated App Store and the verification of the signature on an app. In other words, iOS’s signature verification does not intrinsically require the associated app to originate from the Apple-operated App Store. The

iOS kernel code and process-based middleware that implement signature checking are already capable of being configured to accept third-party signatures (like an enterprise signature) as trustworthy.” (Ex. Expert 5 (Mickens) ¶ 58; Mickens Trial Tr 2601:15-22 (explaining that the various distribution channels currently available on iOS and macOS show a diversity in the implementation of signatures: “In some cases, apps are signed by Apple. In some cases, they’re signed by enterprise developers. In some cases, by third party developers. Or not at all in some cases.”).)

683. Dr. Rubin claims that there have been several well-known problematic apps distributed through the Enterprise and Ad Hoc Distribution programs, and suggests that such apps got through because there was no review process in place. (Ex. Expert 11 (Rubin) ¶¶ 62-66.) However, despite Dr. Rubin’s observations, Apple continues to tout the safety of app distribution through the Enterprise program, claiming to provide “comprehensive methods [that] help protect corporate data in an enterprise environment”. (DX-5492.009.)

K. Apple’s Comparison of Security on iOS vs. Other Platforms is Incomplete and Misleading.

684. Apple argues that, if app distribution on iOS were permitted, the platform would resemble Android from a security perspective. That argument fails for a variety of reasons.

685. Most importantly, Apple ignores a far more appropriate comparison: macOS. As Professor Mickens testified, “if you look at Mac OS and iOS, these are two operating systems, although they share important pieces of functionality, but these are two

operating systems which Apple itself has written, which Apple itself has advertised as being extremely secure”. (Mickens Trial Tr. 2604:16-20.)

686. Mr. Federighi’s claim that Apple has a “significant larger malware problem on the Mac” (Federighi Trial Tr. 3394:4-7) is a litigation-driven argument. Apple has not cited to any pre-litigation studies or documents demonstrating such a “malware problem” on macOS devices. The only data that Apple has identified about the relative prevalence of malware on macOS was generated *after* Mr. Federighi was deposed in this case. (*See* Federighi Trial Tr. 3433:12-3434:4 (testifying that at the time of his deposition, Mr. Federighi admitted not having any data on the “prevalence of malware in signed, notarized applications downloaded from third-party stores”.).) In fact, even though it owns the macOS platform, Apple has not produced any hard data demonstrating that notarized apps are a significant source of malware on macOS.

687. Dr. Rubin does not provide any data concerning the relative security of macOS—focusing instead on Android. For instance, Dr. Rubin claims that there is a higher incidence of Common Vulnerabilities and Exposures (“CVEs”) on iOS vs. Android. (Ex. Expert 11 (Rubin) ¶¶ 45-46.) However, Dr. Rubin acknowledges that CVEs are not specific to security vulnerabilities associated with apps. (Rubin Trial Tr. 3780:14-3781:1.) Dr. Rubin confirmed that his evaluation failed to address the proportion of CVEs that relate solely to apps. (Rubin Trial Tr. 3781:2-4.) Dr. Rubin also conceded that there might be more CVEs reported for Android due to the open-source nature of the Android platform, which would make it easier for members of the public to identify and report CVEs. (Rubin Trial Tr. 3784:15-3785:2.)

688. Dr. Rubin also points to the 2020 Nokia Threat Intelligence Report and his case study on the Chinese Android market to demonstrate a higher incidence of Android infected devices vis-à-vis iOS. (Ex. Expert 11 (Rubin) ¶ 47.). However, Dr. Rubin fails to take account of a number of factors that may contribute to a higher incidence of malware on Android devices, including on Chinese Android devices, but are nevertheless unrelated to an open distribution model.

- a. *First*, Dr. Rubin concedes that fragmentation of the operating system due to a fragmented Android device market could make Android devices more attractive targets for malware. (Rubin Trial Tr. 3776:7-25.)
- b. *Second*, Dr. Rubin claims that Android devices have less secure runtime protections, such as weaker sandboxing mechanisms. He further acknowledges that weaker sandboxing measures could contribute to security weaknesses on Android devices. (Rubin Trial Tr. 3774:3-17.) For example, Dr. Rubin mentions the Man-in-the-Disk vulnerability associated with Epic's launch of the *Fortnite Installer* on Android devices in August 2018, an attack that allowed an intruder to hijack the app installation process and install arbitrary apps in the background of a user's device. (Ex. Expert 11 (Rubin) ¶ 117.) However, Dr. Rubin conceded that this attack was the result from the use of external storage on Android

which, at the time of the attack, was not sandboxed. (Rubin Trial Tr. 3774:24-3775:6.) Dr. Rubin further admitted that he had not assessed whether that vulnerability could happen on iOS (Rubin Trial Tr. 3775:10-13), which may have different sandboxing rules applied to external storage.

- c. *Third*, Dr. Rubin claims that Google Play, a first-party app store on Android devices, has a less stringent and comprehensive review process than Apple. He further opines that this could lead to more malware on the Android platform vs. on iOS. (Rubin Trial Tr. 3777:10-16.)

689. Apple has not commissioned any studies regarding security issues stemming from side-loading apps on Android phones. (Kosmynka Trial Tr. 1018:1-10; Fischer Trial Tr. 851:12-16.)

- a. In fact, iPhones are not significantly more secure than Android phones, even though the Android operating system nominally permits third-party distribution of apps. (Mickens Trial Tr. 2559:15-2560:8.)

690. Apple also has not commissioned any studies regarding the security of other app stores—including the Google Play Store, the Tencent Store, the Huawei Store or the Epic Games Store—compared to Apple’s App Store. (Kosmynka Trial Tr. 1016:25-1017:2; 1017:8-25.)

691. For the reasons above, Apple has failed to demonstrate that the comparative security of the iOS platform can be attributed to its centralized distribution model. Moreover, there is rough parity in the security offered by commodity operating systems for the following reasons: (1) when looking at the engineering cultures for all of the large-scale software vendors, not just Apple but also Microsoft and Google, they try to create a culture of security; and (2) when observing the security techniques that have been implemented by all of the commodity operating systems (iOS, macOS, Windows, Android) over the last few years, the industry appears to have come to similar conclusions as to what security protections make a system secure. (Mickens Trial Tr. 2610:6-23.) This conclusion is supported by the fact that according to the 2020 Nokia Threat Intelligence Report, the average monthly rate of mobile devices infected, including all Android and iOS devices, was 0.23 percent in 2020, and has not exceeded 0.5% over the course of the last few years. (DX-4975.007.)

L. Enabling Third-Party App Distribution Would Not Meaningfully Impact Security on the iOS Platform.

692. For all of the reasons discussed above, enabling third-party app distribution would not sure in a meaningful difference on the security experience of iPhone users. (Mickens Trial Tr. 2600:17-21.) This is, in large part, due to the fact that security on iOS is mainly enforced by the iOS operating system. (*See* Section XI.E.)

693. Notably, if Apple were to open up iOS to third-party app stores, “that would not, for example, prevent users from using the regular app store”; nor would this, in any way, encroach on Apple’s ability to perform reviews for apps that are distributed through its first-party App Store. (Mickens Trial Tr. 2603:5-10.) Both third-party app stores and Apple’s

centralized App Store can coexist, and “users can choose which channel or channels they want to use to download and install apps”. (Mickens Trial Tr. 2603:11-13.)

694. App distribution on macOS serves as a real-life example of how third-party app distribution and Apple’s centralized app distribution can co-exist on a platform, all without compromising security on a platform. (Mickens Trial Tr. 2604:3-6 (“Q. Professor Mickens, would implementing any of these alternative distribution channels on iOS make the iPhone any less secure than the Mac OS, in your opinion? A. I don’t believe so, no”.).)

695. There are a number of additional security features on macOS that enable a more open distribution model. (*See* Section XI.D.) These features can be implemented on iOS with minimal engineering effort—*i.e.*, the amount of code that would have to be written to implement the new features would be “quite minimal”. (Mickens Trial Tr. 2597:22-23; *see* Section XI.D.) Furthermore, scalability issues with respect to Apple’s App Review process (*see* Section XI.F) could be addressed by allowing third-party app stores on the iOS platform, which would spur more competition in the area of providing secure app distribution services. (Mickens Trial Tr. 2702:5-15.)

696. Dr. Rubin claims that enabling third-party app stores on iOS diminish Apple’s ability to adjust its custom-written malware scanners with new malware detected on the iOS platform, which it is currently able to do because Apple controls all aspects of its platform. (Ex. Expert 11 (Rubin) ¶ 88.) However, Dr. Rubin ignores the fact that Apple is already accustomed to relying upon malware identified by third parties into its malware tools used on macOS. (Federighi Trial Tr. 3394:9-15 (“A. So we, on the Mac, combat malware actively. We

have – I mentioned XProtect earlier. We have another mechanism called MRT, the Malware Removal Tool. As we become aware of malware through our own scans, as well as from reports from third-party antivirus and security companies, we remove that malware. We block that malware and we remove that malware.”).) Furthermore, as noted above, Apple has implemented a Apple Security Bounty program that rewards third parties for the work they do to uncover vulnerabilities on Apple’s platforms. (DX-5492.009.) This shows that Apple can, and currently does, learn about malware through a variety of sources, and that third parties are willing to provide such feedback to Apple to improve iOS security.

697. Dr. Rubin also claims that in an open distribution market, if a third-party app store provides exclusive content that is only available on its platform, users might have no choice but to use that store regardless of whether it is secure or reliable. (Ex. Expert 11 (Rubin) ¶ 99.) However, this claim is speculative at best—Dr. Rubin has not presented any empirical evidence that this has happened on other open distribution platforms, including on macOS.

698. Finally, nothing in the evidence or testimony offered by Apple establishes why Apple’s blanket ban on third-party app stores is justified or reasonable. Even if Apple were correct that there may be some third-party app stores that host unsafe and/or insecure apps, Apple fails to explain why its foreclosure of the app distribution market must extend to third-party app stores that are known to be secure and safe. For example, the following facts are not in dispute: (i) there have been zero instances of known malware on the EGS; (ii) Epic has no knowledge of any digitally-pirated content on the EGS; and (iii) the EGS engages in content

moderation and ensures that objectionable content is taken down from its platform. (Allison Trial Tr. 1227:19-1228:8.)

699. Apple has never explained why its ban on third-party app stores extends to stores that are known to be safe. When asked why Apple could not allow stores to operate on iOS that are known to be safe and trusted, Mr. Federighi had no satisfactory answer. Instead, Mr. Federighi responded with open-ended questions, asking “does Apple get to pick who the trusted stores are?” and “who would validate that they are trusted?” (Federighi Trial Tr. 3416:17-25.) Apple makes millions of decisions every year about the safety and trustworthiness of third-party apps—and claims to have a high degree of expertise in running a trustworthy app store. The idea that Apple lacks the ability to determine whether a third-party app store is safe for the iOS platform makes no sense.

700. Simply put, Apple has failed to provide a sufficient procompetitive justification for disallowing third-party app stores, like the Epic Games Store, that are capable of providing an equally secure and safe experience as Apple’s first-party App Store.

XII. SECURITY JUSTIFICATIONS FOR APPLE'S REQUIREMENT FOR IN-APP PURCHASE ARE PRETEXTUAL.

701. There were no widespread or significant security issues regarding payment with the App Store prior to the introductions of IAP or the requirement that apps selling subscriptions use IAP rather than alternate payment solutions, nor evidence that IAP is far superior to third-party payment alternatives with respect to security.

702. As IAP post-dated the App Store, there was a period of time starting with the launch of the App Store where Apple did not require iOS apps to use IAP. (Fischer Trial Tr. 857:3-9; Ex. Depo. 4 at 252:6-13 (Forstall); Ex Depo. 10 at 278:17-21, 279:7-12, 279:17-19 (Forstall); PX-898.)

703. Apple has conducted no “study which looked at the relative safety and security of the App Store in 2008”, in the period of little over a year when IAP was not required in the App Store. (Ex. Depo. 9 at 201:23-202:5 (Fischer).)

704. Similarly, Apple has not conducted “any studies that have compared Apple payment services to any third party service”. (Fischer Trial Tr. 910:9-12; 910:2-5 (“not aware of any studies that demonstrate that Apple’s payment processing methods are more secure than Stripe”); 910:6-8 (same for PayPal)).

705. Apple also has not conducted “any security study. . . which looks at whether or not any of the major credit cards have security issues with regard to payment processing”. (Fischer Trial Tr. 908:20-24.)

706. Apple’s iOS also already offers developers the use of its “most secure methodology for authenticating” users, which is “separate from IAP”. [REDACTED]

707. Apple already allows payment processing solutions from third parties for apps that provide real-world goods and services on iOS and are therefore not subject to Apple's IAP requirement. [REDACTED]

[REDACTED] Rubin Trial Tr. 4016:14-16.). Moreover, the amount of revenue earned by developers of apps that sell physical goods on the iOS platform was estimated to be over \$400 billion as of 2019. (Schiller Trial Tr. 2769:7-16.)

708. Apple itself utilizes third-party payment processing to clear transactions performed through IAP. (Schiller Trial Tr. 3108:11-13 ("Q. Apple uses PayPal as part of its back end, correct? A. That's right").)

709. There is no contemporaneous evidence in this case showing that Apple requires developers to use IAP due to security reasons.

A. Apple Has Not Identified Security Vulnerabilities Created by Third-Party Direct Payment Mechanisms that Are Used on iOS Devices.

710. App Store leaders acknowledge "that there are third party companies which also have . . . safe and secure ways to purchase goods within apps", including PayPal, Amazon Pay, Braintree, Square, and Epic's payment processing system. (Fischer Trial Tr. 906:20-907:18; Ex. Depo. 12 at 75:12-19 (Gray).)

711. Payment systems that accept, transmit or store cardholder data are governed by strict industry security standards, including the Payment Card Industry Data

Security Standard (“PCI DSS”). (Ko Trial Tr. 805:18-23; Rubin Trial Tr. 4018:10-13 (“PCI standard provides a uniform baseline for how payment information is protected by these payment systems”.).)

712. Secure third-party mobile payment systems already exist on iOS. IAP is not required for the sale of physical goods not delivered or consumed in the app. (Evans Trial Tr. 1598:23-1599:6; Rubin Trial Tr. 4016:9-4017:19.) Similarly, apps that sell “person to person” experiences, “may utilize payment methods other than IAP”. (Fischer Trial Tr. 912:18-23.)

713. In addition, Apple already permits non-IAP payment methods for “Multiplatform Services”, “Enterprise Services”, “Person-to-Person Services”, “app[s that] enable[] people to purchase physical goods or services that will be consumed outside of the app” and “Free Stand-alone Apps”. (PX-2790 (App Store Review Guidelines) § 3.1.3; PX-2558 (Guidelines) § 3.1.3.)

714. The use of credit card platforms other than IAP has not led to any “particular security vulnerabilities onto the iPhone hardware”. (Ex. Depo 3 at 171:23-172:1; 172:3-4 (Cue).).

715. Apple has conducted no studies indicating that any of the alternative payment processing methods used for the sale of goods and services or in person to person transactions on iOS were less safe and secure than IAP. (Fischer Trial Tr. 912:24-913:3 (“Q. [Y]ou are not aware of any study that indicates that any of the alternative payment processing methods used by any of those person-to-person experience apps are less safe or secure than IAP,

correct? A. Again, I haven't seen any studies along those lines"); Rubin Trial Tr. 4017:20-4018:2.) And Dr. Rubin testified that he has "not evaluated other payment systems and whether they might cause friction when customers make transactions using them". (Rubin Trial Tr. 4019:6-9.)

716. Apple has not identified any security vulnerabilities associated with the introduction by Epic of Epic direct payment into the *Fortnite* iOS app. (Ex. Depo. 3 at 164:15-19, 164:21 (Cue); Ex. Depo. 11 at 127:6-9 (Friedman); Ex. Depo. 13 at 174:6-12 (Haun); Rubin Trial Tr. 4018:3-5.)

717. Dr. Rubin claims that IAP's fraud protection is enhanced by the very fact that it is a centralized system for the entire iOS ecosystem, because fraud detection learning techniques are more accurate when more data points are available. (Ex. Expert 11 (Rubin) ¶ 128.) However, Dr. Rubin has not compared the relative transaction volume of other payment processors, like Paypal, which processes transactions for physical goods and also for purchases that take place outside of the iOS ecosystem. (Rubin Trial Tr. 4016:18-4017:19.)

718. Dr. Rubin claims that Apple's IAP functionality maintains the integrity and traceability of digital transactions such as by confirming developer's receipt of the transaction and ensuring the delivery of digital goods to appropriate customers. (Ex. Expert 11 (Rubin) ¶ 128.) However, Dr. Rubin fails to account for the fact that separate and apart from relying on a developer's confirmation that a digital purchase has been delivered, [REDACTED] [REDACTED]. (Ex. Depo. 12 at [REDACTED] (Gray).

Conclusions of Law

Note: (i) Yellow highlighting quotes or reproduces materials that the Court has ordered sealed in a prior order or that are subject to a sealing request; (ii) blue highlighting indicates materials that are subject to the pending motions at Dkt. Nos. 602, 657 or 721; and (iii) green highlighting reflects materials that are subject to both (i) and (ii).

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I. OVERVIEW OF EPIC’S CLAIMS

1. The key question before this Court is whether Apple, the company that developed the operating system powering a billion iPhones, known as iOS, violates the antitrust laws when it uses its control of iOS to determine how apps are distributed and in-app payments are processed. Epic’s claims urge this Court to find that Apple’s requirements that all iOS apps be distributed through the Apple App Store and all in-app purchases of digital content go through Apple’s In-App Purchase (“IAP”) system violate antitrust law. Apple urges the Court to find otherwise. The Court rejects Apple’s arguments as unsupported by law or the factual record.

2. Apple’s core argument, to which it returns repeatedly, is that neither the law nor facts supports defining markets downstream from a single brand—here, Apple’s iOS. This is factually incorrect and misstates the law. In *Eastman Kodak Co. v. Image Tech. Servs., Inc.*, the Supreme Court recognized that, while cases of such single-brand product markets may not be common, they do indeed occur. 504 U.S. 451, 481-82 (1992). The Court finds they are present here.¹

3. Apple is a uniquely powerful company and it exerts unique control over iOS devices, their users, and the developers that develop the apps running on them—control that

¹ The Court notes that the term “single-brand product market” is somewhat of a misnomer. While the aftermarket at issue is focused on the distribution of apps written for a single operating system (iOS), neither the foremarket nor the aftermarket at issue are limited to a single brand. As detailed below, the foremarket here is a duopoly, consisting of two brands—Apple’s iOS and Google’s Android operating systems. And while the aftermarket *currently* consists of a single player—Apple itself—that is not pre-ordained, but instead is the result of Apple’s anti-competitive restrictions on iOS app distribution by others. Absent these restrictions, the Court expects the aftermarket would support multiple brands—including Apple’s own App Store, other stores that would offer iOS apps, and independent developers directly distributing their own apps.

it does not exert over its Mac computers, their users, or the developers developing apps for them. Apple is the largest company in the world by market capitalization and has unparalleled reach and strength. Epic has proffered significant, credible evidence that Apple has controlled iOS in myriad ways that support this Court's conclusion that this is the unusual case in which it is consistent with commercial realities to define a single-brand product aftermarket.

4. Once product markets have been defined, the remainder of the facts are largely not in dispute: Apple does not deny that it exercises exclusive control over the distribution of apps on the iOS platform, that it exercises unilateral discretion to reject apps for distribution, that it requires all apps to use its payment solution for all in-app purchases of digital content, and that it prohibits all developers from encouraging or even informing users about alternative channels for making purchases. Apple does not deny that its restrictions are implemented through contractual requirements, unilateral rules, and technical means.

5. As a result of this conduct, consumers and developers have suffered—and unless Apple is enjoined will continue to suffer—higher prices, increased costs, and reduced innovation and output. Accordingly, as set forth below, the Court enjoins Apple from continuing conduct that violates the antitrust laws. The Court is cognizant that to remedy the extensive harm caused by Apple, broad relief is necessary. But in ordering such relief, the Court is not sailing in uncharted water, as Apple suggests. Rather, the Court follows the well-trodden path set forth by cases in this and other Districts finding that where an antitrust violation has been found, it is incumbent upon the Court to issue injunctive relief that is broad enough to “cure the ill effects of the illegal conduct, and assure the public freedom from its continuance”, *In re Data General Corp. Antitrust Litigation*, 1986 WL 10899 at *4 (N.D. Cal.) (quoting *United States v.*

United States Gypsum Co., 340 U.S. 76, 88-89 (1950)), whether the case is brought by a government regulator or a private plaintiff. *Id.* (collecting cases.) That Apple’s conduct has far-reaching implications is not a reason to leave it be; to the contrary, it is a reason to ensure real change in the marketplace.

II. SECTION 2 OF THE SHERMAN ACT: APPLE’S MONOPOLY MAINTENANCE OF THE IOS APP DISTRIBUTION MARKET (COUNT 1).

6. Section 2 of the Sherman Act prohibits persons from “monopoliz[ing], or attempt[ing] to monopolize, or combin[ing] or conspir[ing] with any other person or persons, to monopolize any part of the trade or commerce among the several States, or with foreign nations”. 15 U.S.C. § 2.

7. Epic alleges that Apple has engaged in unlawful monopoly maintenance of iOS app distribution. In sum, Epic alleges that Apple constructed the iOS ecosystem, using a combination of technical and contractual means, to restrict distribution of iOS apps, foreclosing competition, harming the competitive process, and harming consumers. The Court agrees.

8. As explained below, at several different points early in the history of the iPhone, Apple made business decisions to construct iOS and design the iOS platform in ways that restricted access to third parties to further an exclusionary goal of total control over iOS app distribution.

9. When the iPhone was initially launched in 2007, it included only a small group of apps written by Apple. (Findings of Fact ¶ 86.) Third parties had neither software tools nor access necessary to write apps for iOS and have them distributed on the iPhone. (Findings of

Fact ¶ 88) In 2008, that changed: Apple made available a software development kit (“SDK”) for third parties to write apps that could run on iOS, and it also launched the App Store. (*Id.*)

10. Although Apple’s security team had devised a security model that allowed for distribution by third parties, Apple chose to make the App Store the exclusive means of distribution of apps on iOS. (Findings of Fact ¶ 92.) This decision was made as a matter of “policy”, not safety or security (Findings of Fact ¶¶ 589-594.), and is the core of the anti-competitive structure that Apple has created.

11. With the opening of the iOS platform to third-party developers, app developers began writing useful, fun and innovative apps for the iOS platform, and consumers were able to download them onto their devices. (Findings of Fact § II.E.) As noted above, Apple could have followed the access model of personal computers (including its own macOS) and allowed open access to the iOS ecosystem directly from app developers’ websites and Internet-based app stores, and its security team developed a security model that could accommodate that model. (Findings of Fact § XI.D.) Instead, Apple made the choice to block such app downloads from the Internet and limit iOS device owners to apps purchased through Apple via its wholly controlled App Store. (Findings of Fact ¶ 92.) Apple could also have allowed competing app stores on iOS to give consumers a choice of where to get their apps and to give developers a choice on how to reach consumers. Instead, as noted, Apple made the App Store the exclusive means for consumers to obtain, and for developers to distribute, the apps that made the iPhone useful and fun. (Findings of Fact ¶ 92.)

12. Understanding that its exclusive distribution model breaks from traditional models adopted by other general computing devices, Apple publicly offered developers

assurances intended to assuage their concerns. Specifically, when Apple launched the App Store, Apple's CEO Steve Jobs announced that the store's commission was designed only to cover its costs. (PX-880.21, 27.) Mr. Jobs was asked at the time whether the exclusive nature of the App Store would raise any antitrust concerns, and he assured the public—including, importantly, prospective app developers—that the App Store was not intended as a profit center for Apple but instead as a means to facilitate third-party apps that would make the iPhone more attractive to consumers. (PX-880.27.) Mr. Jobs made clear that Apple stood to gain greatly from the App Store regardless of whether the store itself made or lost money, because “We don’t expect this to be a big profit generator. We expect it to add value to the iPhone. We’ll sell more iPhones because of it.” (PX-2060.6.) Accordingly, Mr. Jobs went so far as to assure developers that “we are basically giving all the money to the developers here”. (PX-880.27.) As it turns out, that representation was not true.

13. As intended, the App Store succeeded in attracting developers to write apps for iOS. Those apps made the iPhone more fun and useful, and increased its appeal for consumers, a fact that was touted by Apple itself, which in early 2009 coined the phrase “There’s an app for that” in a series of commercials for its iPhone. (PX-2065.1.) As more consumers purchased iPhones, writing iOS apps became a more and more attractive proposition for developers. (Findings of Fact ¶¶ 101-112.)

14. Indeed, distributing apps on iOS soon became a virtual necessity for any developer seeking to maintain a successful business. Not only did Apple amass an extraordinary number of consumers who used its iOS devices, but those consumers cannot and do not readily switch to use devices that run Android, which is the only real competing mobile operating

system. (Findings of Fact ¶¶ 98, 175.) Only a tiny sliver of consumers use both iOS and Android smartphones at the same time. (Findings of Fact ¶ 175.) The consumers who use iOS face material switching costs in leaving the iOS ecosystem that Apple has constructed. (Findings of Fact § II.B.) As a result, there is a very large set of consumers—north of a billion—that are substantially locked in to iOS mobile devices, and app developers have no choice but to continue writing iOS apps and devoting resources to promoting those apps to iOS users. Otherwise, developers would be unable to reach approximately one billion potential customers, who form the most lucrative part of the available smartphone customer base. (Findings of Fact ¶ 47.)

15. Because the App Store is the exclusive means for developers to reach iOS users, Apple has absolute control over the content of apps and over the terms of trade between developers and users. Apple uses that control to dictate or prohibit various features of apps, and it extracts a non-negotiable “commission” from the sale of apps and in-app purchases of digital content. Among its various restrictions, Apple does not permit any competing means for developers to distribute apps to users, and Apple requires all in-app purchases to flow through its IAP system. Apple even prohibits app developers from informing iOS users that Apple’s monopoly is costing them more for each app they purchase or from informing iOS users of alternative ways to make purchases. (Findings of Fact ¶ 368.)

16. The fact that Apple created a product that users liked and wanted is not a violation of the antitrust laws. But when Apple carefully constructed and enforced contractual and technical restrictions to create and maintain a monopoly in app distribution, a series of anti-competitive effects have followed: Apple causes prices to increase, raises costs for consumers and developers, reduces innovation, and lowers output. (Findings of Fact § V.)

17. Apple has argued that its practices were necessary to get paid and keep the iOS platform safe for iOS users. According to Apple, should this Court require changes to the App Store model, the repercussions would be serious and dangerous. But the evidence disproves this passionate rhetoric. Apple's arguments regarding payment and security are what the antitrust law refers to as Apple's proffered "procompetitive justifications". The Court finds they are pretextual.

18. Addressing first the need to be paid, taking the late Mr. Jobs at his word, that need was never part of Apple's business case for the App Store; as Mr. Jobs had put it, "we don't intend to make money off the App Store. . . . [W]e are basically giving all the money to the developers here and if that 30% of it pays for running the store, well that will be great". (PX-880.27.) The evidence shows that Apple now makes █ in profits on the App Store every year (Findings of Fact § IV.C)—money it had never "intend[ed] to make" and that it cannot now claim it must make in order to recoup its investments. (PX-880.21.) Nor does Apple's ability or inability to get paid for distribution services (or payment solutions) give rise to any concern of free riding; as noted above, developers would not be "free riding" on Apple's intellectual property or efforts even if they did not pay Apple anything for the tools and services Apple provides, because Apple profits greatly and directly from the availability of apps on iOS—it "sell[s] more iPhones because of it". (PX-2060.6.)

19. The evidence is also clear that Apple enjoys multiple types of payments related to iOS—the App Store commissions it charges through the exclusive use of its payment processing system is only one of them. (Findings of Fact §§ II.F, VI.D.) As an aside, the evidence leaves no doubt that Apple's investments in app distribution were long ago paid off,

and it makes more than enough annually to support its ongoing costs. (Ex. Depo. 10 at 175:7-9, 175:11-25 (Forstall).) Apple's sales of iPhones bring in more than [REDACTED] dollars a year (*see* PX-606)—and as Apple acknowledged when launching the App Store, that success is due in no small part to the effort and ingenuity of app developers. (Evans Trial Tr. 1539:10-1540:2; PX-880.) Apple has also brought in [REDACTED] of dollars from fees it charges developers (*see* DX-4178.059; Schiller Trial Tr. 2761:21-2762:2), billions of dollars in app billings (Fischer Trial Tr. 857:19-858:25; 860:19-861:11; 863:4-19; PX-2185.9; DX-4178.003; PX-59.5; PX-2296.31; PX-2218; PX-2217) and [REDACTED] from selling advertising in the search query bar of the App Store itself (Findings of Fact ¶ 129). Any claim by Apple of “free riding” is therefore misplaced; Apple benefits greatly from the labor of developers, and will be fully incentivized to continue providing developers with tools, APIs, intellectual property, and more to ensure the ongoing viability of its promise to consumers that “there’s an app for that”. Indeed, Apple itself with respect to its macOS platform, as well as Microsoft with respect to its Windows operating system, provide tools and APIs to developers to make their platforms more attractive, without enforcing exclusive distribution of apps on either platform.

20. That Apple’s security justifications are a pretext is proved by a simple review of personal computer operating systems: Microsoft has developed methods of keeping users safe on the Windows OS platform. More importantly, Apple itself provides an open economy for apps on its macOS personal computers, yet Apple keeps its macOS customers safe (and gets paid for its investment in macOS). If compelled to cease its anti-competitive actions in regards to iOS app distribution, Apple will continue profiting from the value the App Store brings to its ecosystem and to its bottom line through its extraordinary sales of expensive phones,

and will continue to keep consumers safe, just as it does for macOS users. Indeed, macOS today follows a model similar to the one Apple’s security contemplated for iOS back in 2007—one that does not require exclusive distribution.

21. Below, the Court sets forth the legal standard for monopoly maintenance and the facts supporting the Court’s determination that Apple has engaged in such conduct here.

22. A claim for unlawful monopolization under Section 2 of the Sherman Act requires that a plaintiff show: “(a) the possession of monopoly power in the relevant market; (b) the willful acquisition or maintenance of that power; and (c) causal antitrust injury”. *FTC v. Qualcomm Inc.*, 969 F.3d 974, 989-90 (9th Cir. 2020) (internal quotation marks omitted).

23. Defining the relevant markets is a “threshold step in any antitrust case.” *Id.* at 992. “The relevant market is the field in which meaningful competition is said to exist.” *Image Tech. Servs., Inc. v. Eastman Kodak Co.*, 125 F.3d 1195, 1202 (9th Cir. 1997); *see also Ohio v. Am. Express Co.*, 138 S. Ct. 2274, 2285 (2018) (the relevant market is “the area of effective competition”).

24. There are two components of a market for purposes of antitrust analysis: the products in the market and its geographic scope. The Court will begin with the product market and then turn to the geographic market.

25. There is a relevant market for iOS app distribution, and Apple possesses monopoly power in that market (§ II.A); Apple has willfully maintained its monopoly power in that market (§ II.B); and Epic, as well as other developers, app distributors and consumers, have all been injured by Apple’s conduct (§ II.C). Finally, the Court explains why Apple’s affirmative defenses are unavailing. (§ II.D.)

A. Apple possesses monopoly power in the iOS App Distribution Market.

26. Apps provide functionality to an electronic device. A native app is an app written for a particular operating system and installed onto a device. (Kosmynka Trial Tr. 990:1-3; Grant Trial Tr. 699:16-17 (“A native app would be an application that’s created using the SDK for a platform.”).)

27. Native apps are operating system-specific, an iOS device is only capable of running iOS apps. Apps written for other software platforms such as Android simply do not work on iOS. (Findings of Fact ¶ 227.)

28. The first step in determining the relevant market in which to assess the effects of Apple’s conduct is to take account of the key choice that consumers make in deciding which smartphone to buy, which is a choice between the iOS ecosystem and the Android ecosystem. Developers make the same choice when writing their apps. In the language of antitrust law, this is the “foremarket” or “primary market”. The next step is to define the scope of the downstream market for app distribution on iOS devices, which is an “aftermarket” or “derivative market”. The iOS app distribution market is said to “derive” from the operating system market because without the operating system (in this case, iOS), there would be no app distribution on iOS.

29. In this Section, the Court first defines the relevant antitrust foremarket for smartphone operating systems, the “Smartphone Operating System Market” (§ II.A.i), and demonstrates that Apple has substantial market power in that market (§ II.A.ii). Next, the Court defines the relevant aftermarket for app distribution on iOS, the “iOS App Distribution Market” (§ II.A.iii), explains why this market is a valid single-brand market (§ II.A.iv), and rejects

Apple's proposed digital games transaction market (§ II.A.v). Finally, the Court shows that Apple has substantial monopoly power in the iOS App Distribution Market. (§ II.A.vi).

i. There is a relevant market for smartphone operating systems.

30. The starting point for the analysis of market definition for Epic's Section 2 claims is the conduct alleged by Epic. Specifically, Epic alleges that Apple uses its control of the iOS operating system to monopolize the distribution of apps on that platform. The Court therefore begins its analysis with the iOS operating system, which Apple bundles with its iPhone. Apple distributes the iOS operating system in the Smartphone Operating System Market, which is the relevant antitrust foremarket in which consumers purchase smartphones that have a pre-installed operating system. (Findings of Fact § III.A.)

a. *The first relevant product market is “Smartphone Operating Systems”.*

31. To define the product market, the Court must determine which products or services are in “the area of effective competition”. *Am. Express*, 138 S. Ct. at 2285; *Thurman Indus., Inc. v. Pay 'N Pak Stores, Inc.*, 875 F.2d 1369, 1374 (9th Cir. 1989) (“For antitrust purposes, defining the product market involves identification of the field of competition: the group or groups of sellers or producers who have actual or potential ability to deprive each other of significant levels of business.”). The relevant product market “must encompass the product at issue as well as all economic substitutes for the product.” *Newcal Indus., Inc. v. Ikon Office Sol.*, 513 F.3d 1038, 1045 (9th Cir. 2008). “The consumers do not define the boundaries of the market; the products or producers do.” *Id.* (citing *Brown Shoe v. United States*, 370 U.S. 294, 325 (1962)). “Economic substitutes have a ‘reasonable interchangeability of use’ or sufficient

‘cross-elasticity of demand’ with the relevant product.” *Hicks v. PGA Tour, Inc.*, 897 F.3d 1109, 1120 (9th Cir. 2018) (quoting *Newcal*, 513 F.3d at 1045); *see also Brown Shoe*, 370 U.S. at 325; *United States v. E. I. du Pont de Nemours & Co.*, 351 U.S. 377, 404 (1956). A key aspect of all of these cases is the Court’s focus on the defendant’s product—what other products compete with that product and may therefore constrain the defendant’s market power; it is the availability of such competitive products that defines the metes and bounds of how the seller’s power to raise price or control output is determined.

32. Thus, the law requires that close substitutes to the defendant’s product be included in the definition of the market. In some instances, there may be no close substitutes to the defendant’s product, either because of the nature of the market or, as in this case, because the conduct of the defendant has prevented entry. This fact does not indicate a flaw in the market definition; it means that the defendant is a monopolist in the market.

33. Many markets are referred to as single-sided markets. In single-sided markets, sellers sell products or services to one group of buyers. For instance, grocery stores sell groceries to consumers. Some markets, however, are referred to as two-sided markets. In two-sided markets, a seller “offers different products or services to two different groups who both depend on the platform to intermediate between them”. *Am. Express*, 138 S. Ct. at 2280. In the now classic example, credit card companies sell credit card services to both merchants and cardholders, standing between the two to process transactions between the merchant and the cardholder. *See id.* at 2279-80.

34. As Professor Schmalensee testified, “a two-sided analysis of [a] business is neither pro-defendant nor pro-plaintiff”. (Schmalensee Trial Tr. 1915:4-8.) Rather, in

defining the relevant market for a “two-sided platform”, the Court must undertake additional considerations. A two-sided platform typically experiences “indirect network effects”, which means that the value of the platform to one side depends heavily on the number of users on the other side. Although “it is not always necessary to consider both sides of a two-sided platform”, in the situation where indirect network effects are “more pronounced”, “courts must include both sides of the platform . . . when defining the . . . market”. *Am. Express*, 138 S. Ct. at 2286.

35. Here, smartphone operating systems are two-sided platforms with significant indirect network effects. (Ex. Expert 1 (Evans) ¶43.) That is, a smartphone operating system is significantly more valuable to users if there are many developers developing apps for the operating system; in turn, the operating system is significantly more valuable to developers if there are many users to use their apps. Therefore, in assessing whether there is a valid antitrust market for smartphone operating systems, the analysis must consider both sides of the platform—the consumer-facing side and the developer-facing side.

36. The Court has considered whether potential substitutes for smartphones (and therefore smartphone operating systems) such as feature phones, personal computers, and gaming consoles are adequate substitutes for either consumers or developers. The evidence demonstrates they are not.

37. Consumers do not view other electronic devices as substitutes for smartphones because smartphones have a unique configuration of features, including multi-functionality, portability, the ability to access to the Internet, and cellular connectivity. (Findings of Fact § III.C.)

38. Feature phones are reminiscent of early generation cell phones, typically with dial buttons. They allow consumers to make phone calls and take pictures, but lack many other qualities of smartphones, including a convenient way to access the Internet. Consumers therefore do not consider feature phones to be reasonable substitutes for smartphones. (Findings of Fact ¶ 155; *see Google LLC v. Oracle Am., Inc.*, 141 S. Ct. 1183, 1207 (2021) (ruling in the fair use context that “Google’s Android platform was part of a distinct (and more advanced) market than Java software” because “the broader industry distinguished between smartphones and simpler ‘feature phones’, including based on the “lack[of] a touchscreen”).)

39. Personal computers, including desktop computers and laptops, are not nearly as portable as smartphones and typically rely on a WiFi connection for Internet access. Consumers therefore do not consider personal computers, including both desktop computers and laptops, to be reasonable substitutes for smartphones. (Findings of Fact ¶ 156; *see Google*, 141 S. Ct. at 1191 (“Google tailored the Android platform to smartphone technology, which differs from desktop and laptop computers in important ways. A smartphone, for instance, may run on a more limited battery or take advantage of GPS technology.”); *id.* at 1207 (“And because there are two markets at issue, programmers learning the Java language to work in one market (smartphones) are then able to bring those talents to the other market (laptops).”).)

40. Because Apple has attempted to make this case about a so-called digital game transactions market, it has spent significant time on efforts to persuade the Court that dedicated home gaming consoles should be included within the group of products substitutable for mobile general computing smartphones. Apple’s argument does not conform to commercial reality.

41. The factual record demonstrates that consoles are not substitutable for smartphones. Dedicated gaming consoles, such as Microsoft’s Xbox or Sony’s PlayStation, are single-purpose devices—*i.e.*, their purpose is to play games—and do not include general computing features like smartphones. Further, most gaming consoles are not as portable as smartphones; they often require access to electrical outlets; they must access WiFi to support online play; and they lack typical smartphone functions, such as a camera and a GPS. (Findings of Fact ¶ 157.)

42. Thus, from a consumer perspective, none of these devices is a substitute for smartphones, and none of their operating systems is a substitute for smartphone operating systems. *See Cnty. Publishers, Inc. v. Donrey Corp.*, 892 F. Supp. 1146, 1155 (W.D. Ark. 1995) (excluding television and radio news from product market because, among other reasons, these devices are “not portable and convenient like newspapers”), *aff’d sub nom. Cnty. Publishers, Inc. v. DR Partners*, 139 F.3d 1180 (8th Cir. 1998).

43. Likewise, developers do not view other electronic devices as substitutes for smartphones. Because of the different use cases for smartphones, as opposed to other mobile devices, there are many apps that cannot effectively be used on those other devices. Just by way of example, apps such as ride-share apps that depend on portability, cellular connectivity, and GPS positioning cannot effectively be used on non-portable devices. (Findings of Fact ¶ 157.) Similarly, the vast majority of mobile games are unavailable on consoles or other types of devices. (Findings of Fact ¶ 205.) To take another example, Match Group, which makes dating apps including Tinder, does not make apps for electronic devices such as consoles because those

devices do not offer the same set of features as smartphones and, therefore, are not adequate substitutes. (Ex. Depo. 1 at 12:24-13:25, 120:12-13, 120:16-21, 120:24-25, 121:2-4 (Ong).)

44. For those apps that can be used effectively on multiple devices, devices other than smartphones are still not a substitute for smartphones. Developers typically try to reach as many consumers as possible, and to engage with them in as many circumstances as possible, which generally requires that they develop apps for as many platforms as possible. As a result, they are unlikely to abandon or substitute away from smartphones, which would cause them to lose the substantial percentage of users who do not access apps on other platforms (and even for those users who do access apps on multiple platforms, to lose a substantial percentage of those users' time on the app). (Ex. Depo. 1 at 12:24-13:25, 120:12-13, 120:16-21, 120:24-25, 121:2-4 (Ong); Ex. Expert 1 (Evans) ¶¶ 58-61; Evans Trial Tr. 1460:10-16, 1489:19-1490:8.)

45. Smartphones are critical platforms for developers. Almost everyone has a smartphone with an operating system on it that supports a diverse set of applications. (Findings of Fact § III.A.) And smartphones are often the only device available to consumers when they are away from home. (Findings of Fact ¶ 153.) If developers did not make smartphone apps, then they would not be able to reach consumers who are on the go or who lack alternative devices. (Ex. Expert 1 (Evans) ¶¶ 58-61; Evans Trial Tr. 1460:10-16, 1489:19-1490:8.)

46. Epic's experience is consistent with this dynamic. Epic launched *Fortnite* for smartphones with the express purpose of reaching new users and giving its existing users new opportunities to play. (Sweeney Trial Tr. 111:20-112:1 ("[W]e realized it would be incredibly valuable to open up *Fortnite* to a much wider audience than the PC or console audience that we had so far reached. Smartphones, both iOS and Android, reached a far larger audience than

consoles, and so we really wanted to enable *Fortnite* players to be able to play with all of their friends across all devices that they might own.”).) Epic’s effort paid off: as of August 13, 2020, roughly 64% of the *Fortnite* players who ever played *Fortnite* on an iOS device—more than 70 million users—only ever played *Fortnite* on iOS devices, and on no other devices. (Findings of Fact ¶ 471.) After Apple removed *Fortnite* from the App Store, mobile *Fortnite* users shifted only a small fraction of their playtime to *Fortnite* on other devices. (Ex. Expert 1 (Evans) ¶ 129; Evans Trial Tr. 1524:20-1525:7.)

47. Empirical economic analysis also establishes that the Smartphone Operating System Market is properly defined. An antitrust product market may be defined as a product or group of products such that “a hypothetical profit-maximizing firm, not subject to price regulation, that was the only present and future seller of those products ('hypothetical monopolist') likely would impose at least a small but significant and non-transitory increase in price ('SSNIP') on at least one product in the market.” U.S. Dep’t of Justice & Fed. Trade Comm’n, Horizontal Merger Guidelines § 4.1.1 (2010); *see also Saint Alphonsus Med. Ctr.-Nampa Inc. v. St. Luke’s Health Sys., Ltd.*, 778 F.3d 775, 784 (9th Cir. 2015) (stating that a SSNIP is a “common method” for defining the relevant market); *Theme Promotions, Inc. v. News Am. Mktg FSI*, 546 F.3d 991, 1002 (9th Cir. 2008) (“Determining the relevant market can involve a complicated economic analysis, including . . . ‘small but significant nontransitory increase in price’ ('SSNIP') analysis.”); *Coastal Fuels of Puerto Rico, Inc. v. Caribbean Petroleum Corp.*, 79 F.3d 182, 198 (1st Cir. 1996) (“The touchstone of market definition is whether a hypothetical monopolist could raise prices.”) (citing *Rebel Oil Co. v. Atl. Richfield Co.*, 51 F.3d 1421, 1434 (9th Cir. 1995)). A SSNIP is typically considered to be five to ten percent of

the price paid by consumers for the relevant product or service. U.S. Dep’t of Justice & Fed. Trade Comm’n, Horizontal Merger Guidelines § 4.1.2 (2010).

48. Epic’s principal economic expert, Dr. David Evans, presented economic evidence that a hypothetical monopolist of smartphone operating systems would be able to increase the price of smartphone operating systems *to both users and developers* by at least 10% and still increase its profits. (Ex. Expert 1(Evans) ¶¶ 66-69; Evans Trial Tr. 1491:2-8.) This is strong evidence in favor of Epic’s market definition. *See Saint Alphonsus*, 778 F.3d at 784-85 (affirming district court’s determination of the relevant market based on SSNIP test). Apple’s economic experts, meanwhile, did not attempt a SSNIP test concerning Epic’s proposed Smartphone Operating System Market (or concerning their proposed alternative market).²

49. Instead of performing a SSNIP test, Apple asserts that “the viability of the SSNIP test in the context of two-sided transaction platforms is unsettled”. (Joint Submission Regarding Trial Elements, Legal Framework and Remedies (“Legal Framework”) (ECF No. 276) at 12 (citing *United States v. Sabre Corp.*, 452 F. Supp. 3d 97, 138 (D. Del. 2020).) The sole case Apple cites—*Sabre*—is distinguishable. There, the court acknowledged that a SSNIP is, in fact, a “common method” for defining the relevant product; however, based on the specific facts that indicated the test before it was based on faulty assumptions, it rejected it. *See*

² In its Proposed Findings of Fact and Conclusions of Law, Apple argued that “Dr. Evans’ application of the hypothetical monopolist test does not satisfy the standard for reliability of expert evidence under Federal Rule of Evidence 702”, and that “any testimony from Epic’s experts [about Apple’s experts’ failure to perform a hypothetical monopolist test] is inadmissible as both unreliable and irrelevant pursuant to the *Daubert* standard”. (Apple’s 5/21/21 COL ¶¶ 129, 136.) Apple did not pursue this argument at trial, and the Court finds it unpersuasive in any event.

Sabre, 452 F. Supp. at 142. Moreover, *Sabre* has been vacated on appeal. *United States v. Sabre Corp.*, No. 20-1767, 2020 WL 4915824 (3rd Cir. July 20, 2020).

50. Apple also argues that the Smartphone Operating System Market is not a cognizable market because operating systems are bundled with smartphones themselves, and neither major mobile operating system (iOS or Android) is sold or licensed at a positive price. (See, e.g., Schmalensee Trial Tr. 1959:16-19; but see Schmalensee Trial Tr. 1959:20-1960:9, 1960:17-1961:9 (conceding that “there was a market”, “an ordinary market”, for computer operating systems, as he testified in a different matter); Schmalensee Trial Tr. 1961:22-1962:2 (acknowledging having previously written that “few would dispute that Microsoft has a short-run monopoly over PC software platforms even though consumers could opt for Apple computers and the macOS”).) But as Professor Schmalensee testified, Android is sold at “a zero price in terms of a cash outlay, but there are a number of obligations that OEMs [original equipment manufacturers] take on when they agree to license the Android operating system”, such as “giv[ing] preferential treatment to certain Google services, to Google Play, [and] to certain Google apps . . . as part of the [Android] license agreement”. (Schmalensee Trial Tr. 1962:14-1963:13.) This argument looks at the market only from the consumer side; it is clear that developers make decisions to write apps or otherwise devote resources to a particular operating system (or, more typically, to both operating systems). (Findings of Fact § III.C.) Even from the consumer side, a choice between ecosystems, and thus operating systems, is often the first decision a consumer makes before deciding which device running that operating system to buy. (Ex. Expert 1 (Evans) ¶ 41.) A simple thought experiment proves the point—what would happen if Apple, as owner of iOS, were to attempt to buy the Android operating system from its owner,

Google? That would lead to a near-total monopoly on smartphone operating systems that would never pass antitrust scrutiny, showing that the smartphone operating systems themselves form a relevant market.

b. *The relevant geographic market is global, excluding China.*

51. As noted, in addition to determining which products fall within the relevant market, the Court must also determine the geographic scope of the market. *See Hicks*, 897 F.3d at 1120 (“The relevant market must include both a geographic market and a product market.”). “The criteria to be used in determining the appropriate geographic market are essentially similar to those used to determine the relevant product market.” *Brown Shoe*, 370 U.S. at 336. “A geographic market is an area of effective competition where buyers can turn for alternate sources of supply.” *Morgan, Strand, Wheeler & Biggs v. Radiology, Ltd.*, 924 F.2d 1484, 1490 (9th Cir. 1991) (internal quotation marks and alterations omitted).

52. The Smartphone Operating System Market is global excluding China. The major original equipment manufacturers (“OEMs”), including Apple and the major Android OEMs such as Samsung, market and sell their devices to consumers in virtually all countries where there is sufficient demand for smartphones.

53. China, however, is not part of the Smartphone Operating System Market. (Findings of Fact § III.B.) Due to government regulations, Android OEMs distribute different versions of their devices, running different versions of Android with different sets of pre-installed apps, inside and outside of China. Government regulations, as well as other factors unique to China, also have resulted in the broader digital economy in China being dominated by domestic firms. Most consumers outside China would not consider buying a Chinese

smartphone, along with its operating system, because they would not be able to use many relevant apps. (Ex. Expert 1 (Evans) ¶ 71; Evans Trial Tr. 1491:9-15.) Likewise, most developers would not be able to substitute to Chinese smartphones, and their operating systems, for writing apps because they would not be able to reach most consumers outside of China. (Ex. Expert 1 (Evans) ¶ 71; Evans Trial Tr. 1491:9-15.) As a result, China represents a separate geographic market for smartphone operating systems.

54. Apple contends that the relevant antitrust markets in this case should be limited to the United States. There is no legal or economic basis for this position. The Google Android and iOS ecosystems dominate the world over (except in China). As described above, the major OEMs distribute their smartphones, with the same iOS or Google Android operating systems, to consumers around the world, meaning consumers make their purchasing decisions from among globally available options. And most developers, including Epic, distribute their apps to consumers around the world. (Ex. Expert 1. (Evans) ¶¶ 70, 145; Evans Trial Tr. 1491:9-15, 1537:18-20; Sweeney Trial Tr. 129:7.) Moreover, with respect to the aftermarkets described in more detail below, the Apple conduct at issue applies to consumers and developers globally. (Findings of Fact § III.I.)

55. Apple also contends that the market should be confined to the United States because the U.S. antitrust laws are primarily concerned with U.S. consumer welfare. But that is irrelevant for market definition purposes. *See Morgan, Strand, Wheeler & Biggs*, 924 F.2d at 1490 (focusing on “area of effective competition where buyers can turn for alternate sources of supply”). The fact that Apple has raised a defense to Epic’s claims based on the Foreign Trade Antitrust Improvements Act, 15 U.S.C. § 6a, does not impact the market

definition inquiry, which is a question about the area of effective competition, not the reach of U.S. antitrust laws. U.S. courts regularly recognize global markets in antitrust cases. *See, e.g.*, *United States v. Microsoft Corp.*, 253 F.3d 34, 52 (D.C. Cir. 2001) (upholding relevant geographic market encompassing “the licensing of all Intel-compatible PC operating systems worldwide”); *United States v. Eastman Kodak Co.*, 63 F.3d 95, 108 (2d Cir. 1995) (upholding worldwide geographic market for film). Moreover, the U.S. antitrust laws are also concerned with U.S. businesses, such as Epic, that are harmed by anti-competitive conduct, including harm that such U.S. businesses suffer relating to their transactions with foreign consumers. *See* 15 U.S.C. § 6a (Sherman Act generally applies to conduct affecting “export trade”).

56. For the foregoing reasons, there is a valid antitrust foremarket for smartphone operating systems, which is a two-sided market that provides a platform for users and developers alike. The market is global, excluding China.

ii. Apple has substantial market power in the Smartphone Operating System Market.

57. “Market power is the ability to raise prices above those that would be charged in a competitive market”. *Nat'l Collegiate Athletic Ass'n v. Bd. of Regents of Univ. of Okla.*, 468 U.S. 85, 109 n.38 (1984); *Jefferson Parish Hosp. Dist No. 2 v. Hyde*, 466 U.S. 2, 21 n.46 (1984), abrogated on other grounds by *Ill. Tool Works Inc. v. Indep. Ink, Inc.*, 547 U.S. 27 (2006) (“As an economic matter, market power exists whenever prices can be raised above the levels that would be charged in a competitive market.”).

58. Within the Smartphone Operating System Market, Apple is one of just two meaningful competitors and possesses substantial market power over consumers and developers

alike. The only alternative to Apple's iOS is Google's Android OS; together, they account for nearly 100% of worldwide mobile operating systems. (Findings of Fact § III.E.)

59. A duopoly is a market dominated by two primary participants. There is a strong presumption in the economics of industrial organization that where, as here, a market is a duopoly, both participants have substantial market power. (Ex. Expert 1 (Evans) ¶¶ 74, 84; Evans Trial Tr. 1491:16-1492:12.) The evidence in this case is consistent with this presumption.

60. Apple's iOS operating system accounts for about half of all app usage on smartphones. (Ex. Expert 1 (Evans) ¶ 79.) Apple's iPhone likewise commands a significant share of all smartphone sales; in 2019, for example, iPhone sales accounted for roughly 40% of global smartphone revenue (excluding China). (Findings of Fact ¶ 169.) In the same year, Apple earned [REDACTED] in operating profits from the sale of iPhones worldwide. (Findings of Fact ¶ 48.) These data, together, show the significance of iOS to both users and developers in this two-sided market.

61. Apple's market power in the Smartphone Operating System Market is fortified by the market's substantial barriers to entry. (Ex. Expert 1 (Evans) ¶¶ 73, 90; Evans Trial Tr. 1492:19-1493:5.) Barriers to entry refer to costs that new competitors must face as they enter a market. (Ex. Expert 1 (Evans) ¶ 90.) In this case, new entrants must overcome the high costs of developing their own operating system, creating compatible hardware platforms, and recruiting phone manufacturers to adopt their operating system. Further, the indirect network effects enjoyed by iOS and Android pose an additional high barrier to entry: consumers are unlikely to adopt a new smartphone operating system if there are few apps available for use, and developers are unlikely to write apps for a new smartphone operating system if there are few

consumers available to reach. This “chicken and egg” problem is known as the applications barrier to entry. *See Microsoft*, 253 F.3d at 55. As a result, there has not been a successful new entrant to the Smartphone Operating System Market since 2008. Well-funded entrants like Microsoft have tried and failed, and any prospective new entrant would be (at best) years away from challenging the position of either Apple or Google. (Findings of Fact ¶ 170.)

62. As a practical matter, Google’s Android operating system does not act as a meaningful competitive constraint or a check on Apple’s market power because there is limited switching and high switching costs for consumers between Android and iOS. (Findings of Fact § II.B.) “Switching costs” refer to the expenses and obstacles consumers incur when moving from one operating system to another, including the cost of purchasing a new smartphone, replacing their old apps, losing certain functionalities, losing certain data, and learning a new operating system, among other costs. Further, as detailed by Dr. Evans and Dr. Athey, consumers face significant “mixing-and-matching” costs when they use devices from more than one platform. (Expert 1 (Evans) ¶¶ 83-88; Athey Trial Tr. 1754:19-20; Ex. Expert 4 (Athey) ¶ 26; PX-407; PX-416.) Users incur mixing-and-matching costs when their devices do not operate and synchronize well across platforms, such as when a user begins drafting a document on his or her laptop but then cannot easily access that document on his or her smartphone, or when a user cannot use his or her phone to set parental controls for his or her children’s devices because they are not on the same operating system.

63. Apple is well aware of these costs and, in fact, views increasing consumer switching costs and consumer mixing-and-matching costs as an important feature of its business model. (Findings of Fact § II.B.) For example, Eddy Cue, an Apple executive, acknowledged

that “[t]he more people use our stores the more likely they are to buy additional Apple products and upgrade to the latest versions. Who’s going to buy a Samsung phone if they have apps, movies, etc already purchased? They now need to spend hundreds more to get to where they are today”. (PX-404.1.) He added “[g]etting customers using our stores (iTunes, App and iBook store) is one of the best things we can do is get people hooked to the ecosystem”. (*Id.*) The term “ecosystem” is used by Apple to describe the set of devices and features that work to lock consumers into iOS devices. Apple knows that once consumers choose iOS, they tend not to switch to Android, even in the face of higher prices.

64. Developers also recognize this fact. As noted above, rather than miss out on either operating system’s substantial user base, most developers incur the additional costs of writing the same apps for both Android and iOS. (Findings of Fact § III.D.) For example, according to Apple, “of the top 100 game apps by estimated revenue, *ninety-nine* appear on both platforms”. (Apple’s 5/21/21 Conclusions of Law (“COL”) ¶ 46.) The evidence demonstrates that it is not economically viable for developers to abandon a smartphone operating system when confronted with higher prices or restrictive platform policies. (Ex. Depo. 2 at 79:24-80:10 (Shoemaker).)

65. iOS presents a particularly important marketing channel for developers. Not only are there more than one billion active iPhones (Findings of Fact ¶ 48), but developers have found that “users spent more money on the iOS application than they did on the Android application”. (Ex. Depo. 7 at 320:4-10, 14-22 (Okamoto).) In Epic’s own experience, iOS users spend approximately double what Android users spend in *Fortnite*. This further enhances Apple’s already substantial market power in the Smartphone Operating System Market.

66. This evidence is more than enough to prove Apple's substantial market power in the foremarket. *See Bristol Tech., Inc. v. Microsoft Corp.*, 42 F. Supp. 2d 153, 169 (D. Conn. 1998) (noting that market characteristics of less than 50% market share and high barriers to entry due to network effects could support a finding of *monopoly* power); *N.M. Oncology & Hematology Consultants, Ltd. v. Presbyterian Healthcare Servs.*, 418 F. Supp. 3d 826, 840 (N.D. Tex. 2014) (similar).

iii. There is an aftermarket for app distribution on iOS.

67. There is an aftermarket to the Smartphone Operating System Market for the distribution of compatible apps for the iOS operating system: the iOS App Distribution Market. In theory, this market could include both two-sided platforms (such as the App Store and third-party app stores) as well as one-sided transactions (such as downloading apps directly from developers' websites). Both structures are ways for users and developers to connect, and from both users' and developers' perspectives, a transaction on the App Store, a transaction on a third-party app store, and a direct download from a developer's website would all be substitutes. In practice, however, Apple has foreclosed all participants in the iOS App Distribution Market other than its own App Store.

68. As noted, app stores developed for other operating systems—principally, Android—are not substitutes for app stores that carry iOS apps. The evidence is uncontradicted that apps are written for, and only work on, a specific operating system. iOS apps do not run on Android devices and vice versa. The evidence shows that the Apple App Store does not distribute Android apps, nor do the Android stores distribute iOS apps. Moreover, the iOS App

Store is itself an iOS app that can run only on the iOS operating system, and other app stores cannot run on iOS. (Findings of Fact ¶ 227.)

69. The evidence shows that users and developers do not consider distribution of apps on other platforms to be an adequate substitute for distribution of apps on iOS. To begin with, as discussed above in connection with defining the foremarket for smartphone operating systems, users cannot in most instances turn to an app on a PC or a gaming console as a substitute for using an app on a smartphone. Even if the smartphone app were available on the other platform (which is often not the case), the user still would not be able to use it during many times and places when she would use the app on a smartphone. Because developers need to reach consumers when the consumers want to use an app, developers likewise cannot rely on PCs or gaming consoles as substitutes.

70. Further, Epic's experts have shown that a hypothetical monopolist of the iOS App Distribution Market could profitably raise distribution prices by a SSNIP on iOS app users, on iOS app developers or even on both sides of the market.

71. *First*, as to iOS app users, Epic expert Professor Peter Rossi "conducted a survey to elicit reactions of U.S. consumers to a permanent five percent increase in the price of in-app purchases and subscriptions when purchased from within iOS apps ('at-issue purchases'). The goal of the survey was to measure how consumers would react to a specific price change in their individual spending on "at-issue purchases". (Ex. Expert 3 (Rossi) ¶ 2; Rossi Trial Tr. 2506:9-12; Findings of Fact ¶ 189.) Based on this survey data, Dr. Evans determined that 74% of spending-weighted respondents would not have changed their spending behavior at all, while

just 1.4% of consumers would have switched to a non-iOS device.³ (Expert 1 (Evans) ¶ 137; Findings of Fact ¶ 190.) These results demonstrate that consumers have “inelastic demand” for iOS app distribution, meaning that they are not very responsive to an increase in price. (Ex. Expert 1 (Evans) ¶ 137.)

72. Dr. Evans then determined whether, holding app supply constant, such a 5% increase in consumer prices would be profitable for Apple. To do that, Dr. Evans first determined how much the App Store commission would need to increase in order to cause a 5% increase in consumer prices—and he found that to be a 29.6% increase in the commission. (Ex. Expert 1 (Evans) ¶¶ 136-144.) He arrived at that percentage increase by starting with Apple’s “effective” commission rate across all transaction types, which he calculated using transaction data provided by Apple, as reported in U.S. dollars. (Ex. Expert 1 (Evans) ¶¶ 157, 256.) The effective commission rate for 2019 was 27.7%. (Ex. Expert 1 (Evans) ¶¶ 157, 256.) Dr. Evans then conservatively assumed that if the App Store increased its commission, developers would bear half of the increase, and consumers would bear the other half. (Expert 1 (Evans) ¶ 141.) Under this assumption, a consumer price increase of 5% would require an increase in the App Store’s effective commission of 29.6% (from 27.7% up to 35.9%), which is far more than the typical increase for a SSNIP test. (Findings of Fact ¶ 191; Ex. Expert 1 (Evans) ¶¶ 136-37.)

³ Dr. Evans and Professor Rossi report slightly different numbers because Dr. Evans based his analyses on only the survey respondents who (1) completed the survey and had positive at-issue spending, and (2) provided valid answers to the survey questions relevant to his analysis. (Ex. Expert 1 (Evans) ¶ 136.) For respondents who would have switched devices, Dr. Evans reports the spending-weighted shares of respondents. (Ex. Expert 1 (Evans) ¶ 137; PX-1078.)

73. Dr. Evans then concluded that, taking into account the inelastic demand reflected in Professor Rossi's survey, such a significant increase in price still would not cause consumers to switch away from iOS or reduce their iOS purchases enough to make the price increase unprofitable. (Ex. Expert 1 (Evans) ¶ 141; PX-1078.1.) To the contrary, Apple could have increased its profits by nearly \$825 million in 2019 by increasing the effective commission rate to developers by 29.6%, with a resulting increase in price to consumers of 5%. (Expert 1 (Evans) ¶ 141.) In other words, a hypothetical monopolist of iOS App Distribution—or, in this case, an actual monopolist—could profitably impose a SSNIP on consumers.⁴

74. *Second*, Dr. Evans also considered the developer side of the market, assessing whether developers would substitute away from iOS—*i.e.*, by ceasing to develop for the platform—in the face of a SSNIP of 10%. For developers, the question is whether it would be profitable to continue distributing on iOS even while paying higher fees or to cease distributing on iOS and recapture revenues from iOS app users switching to other distribution channels. (Ex. Expert 1 (Evans) ¶ 131.)

75. To answer this question, Dr. Evans analyzed spending patterns by *Fortnite* users before and after Apple de-listed *Fortnite* from the App Store. *Fortnite* is a conservative test case because *Fortnite* is already available on multiple platforms; most other mobile apps are not available on other platforms, and therefore not all iOS developers could expect to recapture

⁴ The SSNIP test assumes that the pre-SSNIP price is at a competitive level. While the parties disagree whether the existing commission rate is competitive, Apple asserts that it is, so Dr. Evans's decision to use it for his SSNIP test was conservative. If the competitive level is less than the existing commission rate, a monopolist's ability to impose a SSNIP over the iOS App Distribution Market would be even clearer.

iOS revenue at the rate Epic can. (Ex. Expert 1 (Evans) ¶ 131.) Dr. Evans's analysis of *Fortnite* showed that *at most* 50% of *Fortnite*'s iOS revenue was replaced by *Fortnite* users shifting their spending to other platforms. (Ex. Expert 1 (Evans) ¶¶ 131-35.) Dr. Evans then calculated Epic's average profit margin. (Ex. Expert 1 (Evans) ¶ 133.) Using these inputs, Dr. Evans concluded that Epic would find it more profitable to pay a 10% increase in the effective commission rate for the iOS version of *Fortnite* rather than to stop distributing *Fortnite* in the App Store altogether, even if Epic did not pass through any of the increased commission to consumers. (Ex. Expert 1 (Evans) ¶ 133.) Further, he concluded that most iOS developers, who do not have the same opportunities as Epic to shift their iOS revenue to other platforms, would find it even more unprofitable to cease distributing their apps through the App Store in the face of a SSNIP. (Ex. Expert 1 (Evans) ¶ 131.)

76. *Third*, these analyses show that a hypothetical monopolist of iOS app distribution could raise the commission without responses by either side of the market—consumers or developers—being sufficient to make that increase unprofitable. Given the switching costs that face consumers and consumers' demonstrably inelastic demand, a SSNIP in the commission would not result in a material decline in iOS app users, meaning that the iOS platform would not become less attractive to developers and demand by developers would not decline from indirect network effects. Accordingly, the SSNIP in the commission would not cause a decline in the supply of apps, so the iOS platform would not become less attractive to consumers and demand by consumers would not decline as a result of indirect network effects. In sum, a hypothetical (or actual) monopolist of iOS app distribution could profitably impose a SSNIP on both sides of the market simultaneously. *See Saint Alphonsus*, 778 F.3d at 784-85.

77. Apple has argued that if there is a market for the distribution of apps, it must include the distribution of web apps and streaming apps through Internet browsers. The evidence does not support this position. A web app is one available from a website and is utilized on a device (such as an iOS device) through a web browser. (Sweeney Trial Tr. 135:1-3 (“A web app is an application written to run within a web browser”.) Native apps are “faster”, “use less memory”, and “can take advantage of native graphics, libraries, in a way that is either not available or would have to be shoehorned in for a web app or a different kind of application”. (Ex. Depo. 4 at 81:17-24 (Forstall).) These limitations, among others, make web apps less attractive to both consumers and developers. (Findings of Fact § III.L.) Indeed, Apple itself initially intended to release several of its pre-installed iPhone apps as web apps, but changed course due to low performance of those apps. (Findings of Fact § II.D; Ex. Depo. 4 at 77:16-20, 77:24-78:12, 78:16-79:6, 81:2-84:6 (Forstall).) And Epic does not make or distribute a web app version of *Fortnite* because the performance would be materially worse than that of a native application. (Grant Trial Tr. 711:13-18.)

78. Because web iOS apps are not functionally interchangeable with native iOS apps, they are properly excluded from the relevant aftermarket for app distribution on iOS. See *United States v. Grinnell Corp.*, 384 U.S. 563, 574 (1966) (property-protection services that differed in their “utility, efficiency, reliability, responsiveness, and continuity” were not sufficiently interchangeable with central station property-protection services and thus properly excluded from the relevant product market); *Microsoft*, 253 F.3d at 52 (explaining that “non-PC based competitors” such as “portal websites that host server[-]based software applications” were properly excluded from the relevant product market of Intel-compatible PC operating systems

because they “fall far short of performing all of the functions of a PC”); *id.* (excluding Apple’s Macintosh operating system, macOS, from the relevant product market because it was “less appealing to consumers” due in part to the fact that it “supports fewer applications”); *Fed. Trade Comm’n v. Sysco Corp.*, 113 F. Supp. 3d 1, 25-29 (D.D.C. 2015) (finding other modes of foodservice distribution “not functionally interchangeable” with the relevant product market of broadline foodservice distribution in part due to the “inferior . . . quality” and lack of “comparable value-added services” of those other distribution channels); *Fed. Trade Comm’n v. CCC Holdings Inc.*, 605 F. Supp. 2d 26, 41-43 (D.D.C. 2009) (finding the “peculiar characteristics” of certain total loss valuation software, such as “especially accurate, up-to-date valuations, speed, reliance and defensibility, and ability to interface with estimating products”, to support conclusion that other less accurate and less up-to-date total loss valuation methods were properly excluded from the relevant product market); *see also Datel Holdings Ltd. v. Microsoft Corp.*, 712 F. Supp. 2d 974, 997 (N.D. Cal. 2010) (concluding at the pleading stage that “appropriate differentiations” such as “distinct core functionality” were sufficient to demonstrate that there was no “reasonable interchangeability between the Xbox 360 and the Play[S]tation 3 on the one hand, and the Wii, Play[S]tation 2 and personal computers on the other hand”).

79. For similar reasons, cloud gaming and streaming services are also not substitutes for native iOS apps. Cloud gaming or app streaming occurs when an app runs on a remote server that the user accesses. The server that hosts the app sends a live video or audio stream to the device on which the user then views the stream. Epic has made *Fortnite* for PC available through streaming services such as Nvidia’s GeForce Now, but it recognizes that cloud streaming offers a materially worse experience than running a game on a native app, and that this

would particularly be the case on iOS where Apple forces users to access the streaming service through an Internet browser. (Grant Trial Tr. 711:4-6 (“[A web app version of *Fortnite*] would just be frustrating, a very poor experience for users, and it would compare extremely badly to other native apps.”).) Not only is the streamed version of *Fortnite* for PC subject to the technological limitations noted above, but there is also the additional cost to users in the form a subscription to the applicable streaming service. (Grant Trial Tr. 713:25-714:10 (“[S]treaming apps, because they are running on a machine in a data center . . . they’re occupying physical hardware and usually there has to be some sort of fee associated with that, so you may have to join a membership program to have access to streaming apps. The nature of that relationship and the fact that those machines have to be even higher power than a typical web server means that there’s often contention [for] access. So you may regularly find when you go to play a cloud gaming app, that you have to wait in a queue or pay a fee to be . . . a premium member of the service.”).) Streaming apps also cannot be used offline while native apps often can be used without a live WiFi or cellular data connection. (Findings of Fact ¶ 242.) For the foregoing reasons, the distribution of streaming apps should be excluded from the iOS App Distribution Market. *See Grinnell*, 384 U.S. at 574; *Sysco*, 113 F. Supp. 3d at 25-29; *CCC Holdings*, 605 F. Supp. 2d at 41-43; *see also Microsoft*, 253 F.3d at 52 (accepting district court’s finding that macOS was “less appealing to consumers because it costs considerably more” and thus properly excluded from the relevant product market).

80. The geographic scope of the iOS App Distribution Market is global, excluding China, for reasons similar to those discussed above with respect to the foremarket at issue. (Ex. Expert 1 (Evans) ¶ 145.) The App Store distributes apps in 175 countries and regions

(Fischer Trial Tr. 931:11-12), but government regulations make China different. (Findings of Fact § III.I.)

81. Moreover, developers typically release apps on a global basis. Epic, for example, has distributed the mobile versions of its apps—for both Android and iOS—in more than 150 countries around the world. (Findings of Fact ¶ 435.) Epic distribution for *Fortnite*, its other apps (for instance, *Houseparty*), and *Unreal Engine*, is generally worldwide. (Findings of Fact ¶435.)

82. While Apple claims that only distribution of iOS apps to U.S. consumers should be in the geographic market, that argument fails. Apple bases its position on the fact that the App Store has country-specific storefronts, which restrict where consumers can purchase apps. But this condition is the result of the very Apple policies that are at issue in this case. In the absence of Apple’s policies, U.S. consumers would be free to shift their purchasing activity to non-U.S. app stores or direct distribution from developers in the face of a price increase in the United States. This is consistent with a global market. Furthermore, Apple’s argument ignores direct distribution from developers’ websites, which would be unaffected by country-specific storefronts and is another distribution channel in the iOS App Distribution Market (although entirely foreclosed by Apple).

83. Apple’s contention that the geographic market should be limited to U.S. consumers on the theory that the U.S. antitrust laws focus on U.S. consumers is without merit for the reasons stated above regarding the geographic scope of the foremarket.

iv. The iOS App Distribution Market is a valid single-brand market.

84. In its landmark *Kodak* decision, the U.S. Supreme Court recognized that “in some instances one brand of a product can constitute a separate market”. *Kodak*, 504 U.S. at 482; *see also Newcal*, 513 F.3d at 1048 (“[T]he law permits an antitrust claimant to restrict the relevant market to a single brand of the product at issue.”). In such instances, the market is known as a “single-brand market”. Determining whether a single-brand market is proper requires “a factual inquiry into the ‘commercial realities’ faced by consumers”. *Kodak*, 504 U.S. 482 (quoting *Grinnell*, 384 U.S. at 572).

85. Under the Ninth Circuit’s seminal decision in *Newcal*, courts in the Ninth Circuit typically consider four aspects of the alleged market to determine if it is a properly defined single-brand aftermarket. *See Newcal*, 513 F.3d at 1049-50. The first indicator of an aftermarket is that the market is “wholly derivative from and dependent on the primary market”. *Id.* at 1049. The second indicator is that the “illegal restraints of trade and illegal monopolization relate only to the aftermarket, not to the initial market.” *Id.* at 1050. The third indicator is that the defendant’s market power “flows from its relationship with its consumers” and the defendant did “not achieve market power in the aftermarket through contractual provisions that it obtains in the initial market”. *Id.* The fourth indicator is that “[c]ompetition in the initial market . . . does not necessarily suffice to discipline anticompetitive practices in the aftermarket”. *Id.*

86. The iOS App Distribution Market satisfies all four aspects for a valid single-brand market.

87. *First*, the iOS App Distribution Market is “wholly derivative from and dependent on” the Smartphone Operating System Market. *See Newcal*, 513 F.3d at 1049. Without iOS, there would be no market for app distribution on iOS.

88. *Second*, the “illegal restraints of trade and illegal monopolization relate only to the aftermarket, not to the initial market”. *Id.* at 1050. Epic is not challenging Apple’s practices with respect to the sale of smartphone operating systems and the devices in which they are bundled. Rather, the restraints at issue apply only to the aftermarket—specifically, Apple’s technical and contractual restrictions on the distribution of iOS apps.

89. *Third*, Apple’s market power “flows from its relationship with its consumers” and Apple did “not achieve market power in the aftermarket through contractual provisions that it obtains in the initial market”. *Id.* at 1050. Consumers do not contractually agree to obtain apps only through the App Store when they purchase an iPhone. Instead, consumers’ limited access is enforced through technical restrictions (such as preventing consumers from downloading apps directly from websites) on the device and contractual restrictions on the developers (such as requiring distribution through Apple’s App Store).

90. Apple forces developers to forego other distribution channels—such as a non-Apple app store on iOS, or direct downloads onto the iOS platform—as a condition of access to iOS. Apple’s total control over iOS gives it “special access to its consumers” that enables it to ensure that consumers have no other choice. *Newcal*, 513 F.3d at 1050.

91. *Fourth*, “[c]ompetition in the initial market . . . does not necessarily suffice to discipline [Apple’s] anticompetitive practices in the aftermarket.” *Id.* As discussed above, Apple possesses substantial market power in the Smartphone Operating Systems Market.

This is due in large part to the significant switching and “mixing-and-matching” costs faced by consumers when they try to change operating systems, and which are an express part of Apple’s business model of locking consumers into the iOS ecosystem. (Findings of Fact § II.B.)

92. Additionally, consumers face significant information costs that prevent them from considering Apple’s anti-competitive practices in the iOS App Distribution Market when making their decision in the foremarket. Information costs refer to costs incurred by consumers in obtaining complete information relevant to their decision-making. Most consumers are not aware of Apple’s restrictions in the iOS App Distribution Market or their corresponding effect on app distribution costs. Moreover, even those consumers who know the facts about Apple’s practices in the iOS App Distribution Market typically do not or cannot effectively take those facts into account when choosing a smartphone and operating system. This is because the cost of distributing apps is low compared to the overall cost of a smartphone and because it is difficult to calculate and compare the lifecycle costs of smartphones between smartphone operating systems. (Evans Trial Tr. 1508:15-1509:25.) The “lifecycle costs” of a smartphone refers to all costs incurred with respect to a device over its expected lifespan, including the purchase price of the device and all apps that the consumer downloads onto the device, among other costs. (Evans Trial Tr. 1509:13-17); *Kodak*, 504 U.S. at 473.

93. Apple intentionally increases information costs. It expressly prevents developers from informing consumers of the availability of alternative purchase options and rejects apps from the App Store for disclosing the fact of Apple’s 30% commission. (Findings of Fact ¶¶ 368, 419.) Apple does not internally estimate the average consumer’s lifetime spend on

apps and, therefore, does not provide that information to consumers when they are choosing a smartphone operating system. (Findings of Fact ¶ 221.)

94. Apple argues that at least developers “knowingly and voluntarily signed the DPLA in which they agreed to bind themselves to Apple’s policies”. (Apple’s 5/21/21 COL ¶ 106 (internal quotation marks and alterations omitted).) But developers cannot discipline Apple’s conduct for the reasons explained above. They must be on iOS to access the one billion iOS users. (See Findings of Fact ¶ 84.)

95. Apple also argues that “[a]n antitrust plaintiff cannot succeed on a *Kodak*-type theory when the defendant has not changed its policy after locking-in some of its customers”. (Legal Framework (ECF No. 276) at 15 (quoting *PSI Repair Servs., Inc. v. Honeywell, Inc.*, 104 F.3d 811, 820 (6th Cir. 1997))). But that is not what either *Kodak* or *Newcal* require. In *Teradata Corp. v. SAP SE*, No. 18-cv-03670-WHO, 2018 WL 6528009 (N.D. Cal. Dec. 12, 2018), the court recognized that a change in policy was one possible way of satisfying *Newcal*’s fourth factor, but not the only way. *See id.* at *17 (fourth factor takes into account whether “market imperfections . . . prevent consumers from realizing that their choice in the initial market will impact their freedom to shop in the aftermarket” (quoting *Newcal*, 513 F.3d at 1050)). Although a post-lock-in change in policy can give rise to a valid single-brand market, whether the policy was put in place before or after consumers made their selection in the foremarket is not determinative. Instead, Epic only must show that “market imperfections . . . prevent consumers from realizing that their choice in the initial market will impact their freedom to shop in the aftermarket”. *Newcal*, 513 F.3d at 1050; *see also Red Lion Med. Safety, Inc. v. Ohmeda, Inc.*, 63 F. Supp. 2d 1218, 1231 (E.D. Cal. 1999) (“Information costs may be

high, and a manufacturer may thus have considerable market power in the aftermarket, even in the absence of a change in policy.”); *Ward v. Apple Inc.*, Case No. 12-cv-05404-YGR, 2017 WL 1075049, at *7 (N.D. Cal. Mar. 22, 2017) (agreeing with *Red Lion*, 63 F. Supp. 2d at 1231-32, that a policy change is not necessary to find a valid single-brand market under *Newcal*). As set forth above, that requirement is satisfied here.

96. In any event, Apple *has* changed its stated policy with respect to the commissions it charges for app distribution. As noted above, in 2008, when the App Store was launched, Apple’s founder, Steve Jobs, sought to assuage developer concerns by promising them that the 30% commission was intended to “pay for running the App Store” and that Apple would be “giving all the money to the developers”. (PX-880.21, 27.) As late as 2011, Phil Schiller, the executive currently in charge of the App Store, suggested internally that “once we are making over \$1B a year in profit from the App Store, is that enough to then think about a model where we ratchet down from 70/30 to 75/25 or even 80/20 if we can maintain a \$1B a year run rate?” (PX-417.1.) The App Store was not supposed to be the juggernaut profit center it has become, and many developers likely made their initial investments in iOS apps with that understanding. Today, however, the App Store has developed ever more ways to monetize app distribution—extending even to search-based auctions within the App Store that have brought in [REDACTED] dollars. (Findings of Fact ¶ 129.) The evidence at trial demonstrates that the App Store long ago earned back its initial investment, is highly profitable, and makes Apple [REDACTED] of dollars a year beyond any measure of operating costs. (Findings of Fact § IV.C.) All these facts constitute a change in Apple’s stated policy that has occurred after many developers and users alike have

become “locked in” to the iOS ecosystem—and after the platform has reached a tipping point, becoming a “must have” platform for developers.

97. Moreover, contrary to its claims, Apple has repeatedly increased prices after developers and consumers were locked in, including by requiring use of Apple’s IAP to process payments for in-app digital content (2009); requiring IAP for subscriptions (2011); instituting anti-steering rules (2011); and charging developers for search ads (2016). (Findings of Fact § IV.C)⁵

v. The relevant market is not digital game transactions.

98. Apple has centered its defense on an alternative antitrust market defined in terms of “digital game transactions” on what Apple refers to as gaming transaction platforms. This theory misapplies longstanding antitrust principles and does not fit the facts of the case.

99. To construct its “digital game transactions” market, Apple starts with a clear legal error: looking at the business Epic purportedly is in rather than the conduct at issue in Epic’s claims. Apple argues that Epic is a developer of gaming apps, and that it is therefore proper to start by assessing a market relating to transactions in gaming apps, on the theory that

⁵ Apple urges the Court to disregard Epic’s market definition because Epic did not allege in its Complaint the existence of a foremarket for operating systems and an aftermarket for app distribution services. (Apple’s 5/21/21 COL ¶¶ 82-83.) The Court declines to do so and finds that this argument elevates form over substance. While it did not use the terms “foremarket” and “aftermarket” in its Complaint, Epic detailed at length how competition in the foremarket cannot discipline Apple’s conduct in the aftermarkets. (See ECF No. 1 at ¶¶ 156-83.) Epic was under a duty to allege the relevant facts, which it did; it was under no duty to explain in detail its legal theory. The Court also addressed this issue in its preliminary injunction opinion, *Epic Games, Inc. v. Apple Inc.*, 493 F. Supp. 3d 817, 835-38 (N.D. Cal. 2020), so Apple has long been on notice of it.

they are the product at the center of the case. This is simply not the legal standard, as noted below. Setting aside the legal error underlying this argument, it simply does not square with the evidence. As Apple's own economic experts testified, the App Store sells a single product: transactions. “[T]he transaction services provided by the App Store are the same services whether the developer sells games or music or coffee or crocheting materials.” (Schmalensee Trial Tr. 1955:3-8, 1954:17-1955:1 (agreeing that “that transaction service . . . has nothing whatsoever to do with the content that the developer then provides to the user”).) There is no difference between the transactions Apple sells to Epic and the transactions Apple sells to any other app developer. Moreover, Epic is not just a developer of gaming apps. Aside from developing products like *Fortnite* (which is in fact not simply a game but also a forum for social activities like concerts and movies), Epic also develops and distributes on iOS the social networking app *Houseparty*. (Sweeney Trial Tr. 305:14-23; Grant Trial Tr. 664:15-16; Fischer Trial Tr. 971:25-972:3; PX-2951.) Apple concedes that *Houseparty* is not a game. (Fischer Trial Tr. 972:5-6 (“I believe *Houseparty* is considered a social networking app.”); Schmid Trial Tr. 3289:12-15; PX-2951.) The category of *Houseparty* on the App Store proves that the app is not a game, notwithstanding the fact that Apple permits the developer to “assign . . . categories to [its] app”, because “[c]hoosing categories that are not appropriate for [an] app is against the App Store Review Guidelines”. (DX-5552.1.)

100. Additionally, Epic develops one of the most prominent three-dimensional environment building tools (*Unreal Engine*), and numerous “middleware” tools and assets used by third parties for a wide range of software products. Epic develops and distributes on iOS non-gaming apps that work in conjunction with *Unreal Engine* including *Unreal Remote* and *Live*

Link Face. (Grant Trial Tr. 664:21-665:17; *see also* Sweeney Trial Tr. 117:2-4.) These apps “provide a means for people who work in the movie or TV industry to capture performances and view them on *Unreal Engine*”. (Grant Trial Tr. 664:24-665:5.) Apple concedes that *Unreal Remote* and *Live Link Face* are not games. (Fischer Trial Tr. 972:14-974:11; PX-2952; PX-2953.)

101. Moreover, “[d]evelopers who wish to have sophisticated realtime graphics will often rely on *Unreal Engine* to provide those even though it may not be in a gaming context.” (Grant Trial Tr. 666:3-5.) For example, a number of real estate mobile apps such as Goldfields, Comstock Homes, and HomeByMe rely on *Unreal Engine*. (Grant Trial Tr. 666:6-15; *see also* Grant Trial Tr. 666:12-15 (“McLaren used *Unreal Engine* as part of their car configuration for high-end sports cars. Apple themselves used *Unreal Engine* to build an AR experience for the Apple Park Visitor Center.”).)

102. Epic is also a third-party PC app publisher, and a distributor of third-party apps through its own PC app store. Epic would offer its app store to compete with Apple’s App Store if Apple’s restrictions were lifted. (Findings of Fact ¶ 313.) Apple’s attempt to define a market on the premise that Epic’s interest and claims are limited to gaming apps is not just legal error but factually incorrect.

103. Apple responds that “[i]t is legally irrelevant to market definition that Epic’s affiliates offer products and services other than game apps (or a game app store).” (Apple’s 5/21/21 COL ¶ 71.) But Apple’s cited cases are not about market definition. *See Sun Microsystems Inc. v. Hynix Semiconductor Inc.*, 608 F. Supp. 2d 1166 (N.D. Cal. 2009) (FTAIA); *In re Domestic Drywall Antitrust Litig.*, 2019 WL 3098913 (E.D. Pa. July 15, 2019)

(Article III standing). And in any event, Epic is not asserting claims on behalf of its affiliates. The point is that the record includes evidence of how Apple’s conduct impacts non-game apps, including Epic’s non-game apps.

104. Apple is also wrong on the law regarding how markets are defined. As stated above, a basic principle of antitrust law is that relevant product markets are defined as a tool to understand the nature of the competition that could constrain the defendant’s allegedly unlawful conduct. Since the earliest cases, *e.g.*, *Brown Shoe*, 370 U.S. at 325-26, the Supreme Court has instructed courts to anchor this analysis to the potential economic substitutes for the *defendant’s product* that is the subject of the allegedly anticompetitive conduct. Looking at the *plaintiff’s characteristics* is not part of the analysis. *See, e.g., Newcal*, 513 F.3d at 1045 (“The consumers do not define the boundaries of the market; the products or producers do.”); *Lockheed Martin Corp. v. Boeing Co.*, 314 F. Supp. 2d 1198, 1228 (M.D. Fla. 2004) (“Determining which products make up the market is the first step. Purchasers are relevant at this initial stage only insofar as their demands govern cross-elasticity, which determines whether and which substitutes are relevant products.”); *Soap Opera Now, Inc. v. Network Publ’g Corp.*, 737 F. Supp. 1338, 1345 (S.D.N.Y. 1990) (“Although it is proper to identify the ultimate consumer of the product in order to make a determination as to whether two products are reasonable substitutes for one another[,] . . . a definition of the market itself which consists of consumers or potential consumers may, as here, obfuscate the issues of monopoly power and reasonable interchangeability.”).

105. Apple cited only one case, *Ohio v. Am. Express Co.*, 138 S. Ct. 2274 (2018), in support of its position that market definition should depend on the identity of the

plaintiff. (Apple’s 5/21/21 COL ¶ 70.) But the Court in *Amex* did not define the market based on the identities of the plaintiffs; it could not have, given that the plaintiffs were “the United States and several States”. *Am. Express*, 138 S. Ct. at 2283.

106. The ultimate question is what products constrain the ability of the alleged monopolist to raise price or reduce output with regard to the market it is alleged to have monopolized. *See Newcal*, 513 F.3d at 1045 (“the market must encompass the product at issue as well as all economic substitutes for the product” and “include the group or groups of sellers or producers who have actual or potential ability to deprive each other of significant levels of business” (internal quotation marks omitted)); (Ex. Expert 1 (Evans) ¶¶ 34-35). Here, for this Section 2 claim alleging conduct that affects the distribution of all iOS apps, that market is iOS app distribution. Apps on other platforms would only enter the analysis to the extent consumers and developers could reasonably turn to them in the face of worsening terms (a price increase or a decrease in quality) and here, as noted above, they cannot.

107. Apple’s focus on the identity of the plaintiff leads it to a proposed market that is, in one respect, too narrow. The challenged conduct is not specific to Epic or to game apps. Apple’s restrictions on alternative iOS distribution channels apply to all app developers, no matter the type of app they develop, and to all potential app distributors, no matter the type of apps they would distribute. Likewise, as discussed below, Apple’s restrictions on payment processing apply to all in-app transactions for digital content, not just digital game transactions. (Ex. Expert 16 (Evans) ¶ 37; Ex. Expert 13 (Cragg) ¶ 15.)

108. While Apple argues that the competitive conditions facing the distribution of gaming apps are different from the competitive conditions facing other apps, that is both

irrelevant and imprecise. It is irrelevant because, as noted, the Apple conduct at issue extends to a wide variety of apps, and neither Epic’s claims nor Epic’s business is limited to gaming apps. It is imprecise because the logical conclusion of Apple’s position would be to fragment the market even further. The substitution possibilities facing iOS players of an immersive multi-player game like *Fortnite* that is available on several platforms are different from the substitution possibilities facing iOS players of games that depend on GPS positioning like *Pokémon Go* (which are available only on mobile devices) or of simple and casual games like *Words With Friends* (which are better suited for mobile device play and typically not available on devices like gaming consoles). If Apple’s market definition analysis were correct, it would suggest an even narrower market for immersive multi-platform games, but even Apple recognizes that is not a tenable position.

109. In another respect, Apple’s proposed market is far too broad. Apple contends that its “digital game transactions” market extends outside iOS to all other platforms on which game transactions can occur. But it has not shown that iOS users could or would substitute their gameplay or game transactions to other platforms in sufficient numbers to make a SSNIP on iOS game distribution unprofitable. Instead, all that Apple has shown is that it is *possible* for consumers to play games on platforms other than iOS and for developers to develop games for those platforms. This point is not in dispute. What Apple’s economic experts do not show is whether the existence of these other platforms constrains Apple’s conduct, because they have not tested whether consumers or developers would shift their purchasing activity to these platforms in response to a SSNIP. (Ex. Expert 16 (Evans) ¶¶ 11, 15-17; Ex. Expert 13 (Cragg) ¶ 18.) Nor do they contend with the fact that most iOS games are not even available on many

other platforms, such that substitution would be impossible. (Ex. Expert 13 (Cragg) ¶¶ 52, 79, 84.)

110. Further, Apple never contends with the fact that, even if an app is available on more than one platform, and even if a user can make purchases on more than one platform, there is still no substitute for *downloading* the app on an iOS device. A user cannot watch Netflix on her iPhone unless she has downloaded the Netflix app onto her iPhone; downloading the app onto her PC is not a substitute. Thus, distribution of the app on the PC is not an economic substitute for distribution of the app on the iPhone unless use of the app on the PC would be a substitute for use of the app on the iPhone—and for all the reasons stated above regarding the unique features of a smartphone, it is not.

111. Epic's experts have explained the myriad ways the evidence upon which Apple's experts rely is unreliable. For example, Dr. Cragg demonstrates how Professor Hitt's analysis purporting to show a degree of substitution in *Fortnite* between iOS and Nintendo Switch, a game console, in fact shows that the platforms are complementary. (Ex. Expert 13 (Cragg) ¶¶ 58-64.) That is, consumers tend to *increase* their play of *Fortnite* on iOS if they begin to also play on the Switch, rather than switching hours from one platform to the other. Even Professor Schmalensee, has agreed that Professor Hitt's analysis was “[un]supported by the analysis in his report”. (Schmalensee Trial Tr. 1933:24-1935:13.) And moreover, the two platforms could not be substitutes because, as Professor Hitt admitted, at most 0.3% or 0.4% of the iOS *Fortnite* user population actually began playing on the Switch when *Fortnite* was released on that platform, and the number of Switch consoles is a fraction of the number of iOS devices. (Hitt Trial Tr. 2197:18-2198:5.)

112. Dr. Hitt's analysis of a so-called "retention rate" following the delisting of *Fortnite* from the App Store also fails to measure accurately the rate of substitution between iOS and non-iOS users of *Fortnite*. (Evans Trial Tr. 2372:19-22.) Dr. Hitt's study of *Fortnite* user data did not exclude consumer spending that remained unchanged on other platforms before and after *Fortnite* was removed from iOS, and that was unaffected by the termination of *Fortnite* from the App Store. Instead, this spending was included in his calculation of substitution even though the consumer made no changes. (Evans Trial Tr. 2372:23-2374:4.) An accurate measure of substitution would require looking at the portion of iOS revenue that was subject to the change in circumstances and was replaced, as Dr. Evans did. (Ex. Expert 1 (Evans) ¶¶ 127-30; PX-1080.)

113. As noted above, a valid market definition considers the potential economic substitutes for the defendant's product that is the subject of the allegedly anticompetitive conduct, not the plaintiff's product. To accept Apple's theory of market definition based on the plaintiff's business would lead to odd results—two cases involving the same conduct by the same defendant and the same set of facts nevertheless could result in different product markets and different results depending on the identity of the plaintiff. (Ex. Expert 16 (Evans) ¶¶ 11-13.) For instance, Professor Hitt agreed that if the same allegations were made by Spotify, the market definition would be different. (Hitt Trial Tr. 2189:17-22.) To take another example, it is unclear how Apple would attempt to define the market in the related class actions or if a government enforcer brought suit. Professor Schmalensee admitted that if a large group of app developers that make different types of apps brought this lawsuit, he would have to reconsider his opinions on market definition because there might be no alternative but to consider all apps in the relevant

market. (Schmalensee Trial Tr. 1944:14-20.) Professor Schmalensee also conceded that if the Department of Justice challenged the same conduct by Apple at issue in this case, he would also have to consider whether the relevant market would encompass the broader app market. (Schmalensee Trial Tr. 1944:21-1945:5.) Another of Apple’s economists, Dr. Lafontaine, had never heard of *Houseparty*, a social networking app developed by Epic, or reviewed a complete list of apps developed by Epic. (Lafontaine Trial Tr. 2046:16-2047:9.) Professor Schmalensee conceded that if Epic offered a portfolio of game and non-game apps—which it does—that would affect his market definition analysis; and if Epic were “suing in its capacity as a distributor of apps”—which it is—“the relevant market would be . . . the market for being an app store”. (Schmalensee Trial Tr. 1945:9-15, 1946:6-10.) In fact, Apple itself has argued that “the ‘crux’ of Epic’s complaint is that Apple’s conduct has unfairly injured its economic interest in that it may not distribute iOS apps through EGS or use Epic direct payment to process transactions on its apps”. (Apple’s 5/21/21 COL ¶ 624.)

114. Finally, Apple argues that in defining the iOS App Distribution Market, Epic is improperly attempting to “cluster” two distinct product markets—game and non-game digital transactions. (Apple’s 5/21/21 COL ¶¶ 75-77.) Epic is not “clustering” anything. In *FTC v. Staples, Inc.*, 190 F. Supp. 3d 100, 123 (D.D.C. 2016), the primary case on which Apple relies, the question was whether office supplies such as “pens, file folders, Post-it notes, binder clips, and paper for copiers and printers” comprised a cluster market. *Id.* at 117. The situation here is not analogous. The App Store sells only one product—*transactions*—to users and developers of gaming and non-gaming apps alike. Whether those apps compete with each other in some

downstream market is irrelevant to determining the substitutes to the transactions provided by the App Store.

vi. Apple has monopoly power in the iOS App Distribution Market.

115. Monopoly power is “the power to control prices or exclude competition”. *Grinnell*, 384 U.S. at 571 (internal quotation marks omitted). “More precisely, a firm is a monopolist if it can profitably raise prices substantially above the competitive level”, *Microsoft*, 253 F.3d at 51, “without inducing so rapid and great an expansion of output from competing firms as to make the supra-competitive price untenable”, *Harrison Aire, Inc. v. Aerostar Int’l, Inc.*, 423 F.3d 374, 380 (3d Cir. 2005) (internal quotation marks omitted). “Monopoly power under § 2 requires, of course, something greater than market power under § 1.” *Kodak*, 504 U.S. at 481.

116. Epic submitted substantial evidence demonstrating Apple’s monopoly power in the iOS App Distribution Market. In addition, Apple’s lead economist, Professor Schmalensee, conceded that if Dr. Evans’s market definition is correct (which the Court finds it is), Apple would be a monopolist. (Schmalensee Trial Tr. 1895:19-1896:7.)

117. It is uncontested that if the market is iOS app distribution, Apple possesses essentially a 100% share. There are more than one billion iPhones around the world, and the only effective way for owners of those devices to obtain apps is through Apple itself. Apple preloads the App Store onto the home screen of all iOS devices (Fischer Trial Tr. 857:13-15), and through both technical and contractual restrictions, Apple prevents all alternative distribution channels. (Findings of Fact § IV.A.) Apple’s Developer Enterprise Program, which permits distribution outside the App Store to employees of large organizations, is not a meaningful

alternative to the App Store because it does not permit developers to reach customers. (Findings of Fact ¶ 275.) And “jailbroken” devices, that is, devices on which the user has bypassed various restrictions on installing apps that Apple has programmed into iOS, are not meaningful alternatives due to the associated risks for developers and users alike. Therefore, as a practical matter, Apple’s App Store represents the exclusive channel for consumers to download and developers to distribute native iOS apps.

118. Besides Apple’s nearly 100% market share in the iOS App Distribution Market, there are numerous indicia that Apple possesses monopoly power.

119. *First*, the App Store enjoys extraordinarily high profit margins. As this Court has noted, “[t]he question of whether, and if so, to what extent, supra-competitive profits exists in a relevant market is evidence of market power” and “[s]uch information is highly probative in an antitrust case.” (Pretrial Order No. 8 (ECF No. 548) at 2); *see Bailey v. Allgas, Inc.*, 284 F.3d 1237, 1252 (11th Cir. 2002) (explaining that “the consistent extraction of supracompetitive profits may be an indication of anticompetitive market power”). As reported in presentations to App Store executives, the App Store generated net revenues of [REDACTED] and [REDACTED] in fiscal years 2018 and 2019, respectively. (Findings of Fact ¶ 277.) These net revenues translate to profit margins of [REDACTED] for fiscal year 2018 and [REDACTED] for fiscal year 2019, after taking specific App Store expenses and categories of expenses that are allocated to the App Store into account. (Findings of Fact ¶ 277.) Ned Barnes, Epic’s forensic accounting expert, accounted for additional expenses associated with the App Store that were alleged by Apple to be related to the App Store. After taking those additional costs into account, Mr. Barnes reported margins for the App Store of 79.6% for fiscal year 2018 and 79.6% for fiscal year 2019.

(Findings of Fact ¶ 280.) By way of comparison, these profit margins are approximately four times higher than the profit margins of other online marketplaces where profits are measured on a comparable basis. (Ex. Expert 1 (Evans) ¶ 151; *see also* Barnes Trial Tr. 2465:16-2466:2.)

120. These numbers are generally consistent with documents prepared by Apple's Corporate Financial, Planning & Analysis team for Apple's CFO and Mr. Cook, which report the following fully burdened profit margin percentages for the App Store as a standalone profit center: [REDACTED] for fiscal year 2016, [REDACTED] for fiscal year 2017, [REDACTED] for fiscal year 2018, [REDACTED] for fiscal year 2019, and [REDACTED] for projected fiscal year 2020. (Findings of Fact ¶¶ 279-282.) According to benchmarking performed by Apple itself, comparing the App Store's projected fiscal year 2020 operating margin percentage against the profit margin percentages for Apple's other service business lines—as well as external companies including Netflix, Disney, Nintendo, and Activision—the App Store's profit margin greatly exceeds the highest profit margin of any benchmarked company, with that margin ([REDACTED]) being over [REDACTED] higher than the closest benchmark. (Findings of Fact ¶¶ 279-282.)

121. *Second*, Apple's standard commission rate of 30% of the price of an app is supra-competitive. *See Microsoft*, 253 F.3d at 51 (“Where evidence indicates that a firm has in fact profitably [raised prices substantially above the competitive level], the existence of monopoly power is clear.”). Apple recognized this early on. In 2011, when the App Store's annual profits were just over \$1 billion dollars annually, Mr. Schiller told his fellow executives he doubted that the 30% commission rate “will last . . . unchanged forever”, noting that in the face of a competitive challenge Apple would “want to adjust” its pricing model. (PX-417.1.)

Apple set the commission rate without regard for the App Store's anticipated operating costs or the costs of providing developer software development tools. (Findings of Fact ¶ 292.)

122. Even today, Apple does not consider its costs when discussing changes to its commission structure, nor does it bother to track relative pricing of apps on other platforms such as Android. (Findings of Fact ¶¶ 294, 302-303.) In other words, Apple is unconstrained by costs or competitive pressures in setting the commission rate it charges developers. Instead, it is free to price discriminate—that is, charge different developers different prices—without adversely affecting its bottom line. For instance, Apple charges a 30% commission to apps selling digital content, yet charges nothing to app selling physical goods.

123. Further, after this litigation began and regulatory and legislative scrutiny of its conduct increased, Apple announced the App Store Small Business Program, under which Apple charges certain qualifying developers a 15% commission; Apple produced no evidence suggesting this pricing move was in response to or affected by declining costs or increased competitive pressures. [REDACTED]

[REDACTED]. (See PX-2303.4; PX-2389.13.)

124. *Third*, Apple's treatment of developers is consistent with the exercise of monopoly power. Apple's distribution agreements are contracts of adhesion that developers small and large—including multi-billion dollar companies like Epic, Microsoft, and Facebook—must accept without an opportunity to negotiate terms. Additionally, developers are at the mercy of the App Store's App Review process when it comes to distributing their apps to consumers, as Apple has significant discretion in deciding which apps are approved, delayed or rejected during

review. (Findings of Fact ¶ 264, § XI.F.) Finally, Apple has used the App Store “as a weapon against competitors” (PX-99.5; Ex. Depo. 2 at 75:14-16 (Shoemaker)), rejecting or delaying apps that compete with its own products on “pretextual grounds”. (Ex. Depo. 2 at 88:2-8 (Shoemaker).)

B. Apple willfully maintains its monopoly power.

125. The Court has found that Epic’s market definitions are proper, and that Apple has monopoly power in the iOS App Distribution Market. The next step of the analysis is to consider whether Apple has engaged in anti-competitive conduct to maintain its monopoly.

126. Unilateral conduct, that is, conduct by one firm as opposed to a combination of firms, is evaluated under the “rule of reason.” *Qualcomm*, 969 F.3d at 991. “Regardless of whether the alleged antitrust violation involves concerted anticompetitive conduct under § 1 or independent anticompetitive conduct under § 2, the three-part burden-shifting test under the rule of reason is essentially the same. . . . The similarity of the burden-shifting tests under §§ 1 and 2 means that courts often review claims under each section simultaneously.” *Id.*; accord *Microsoft*, 253 F.3d at 59 (“[I]t is clear . . . that the analysis under section 2 is similar to that under section 1 regardless whether the rule of reason label is applied.” (internal quotation marks omitted) (quoting *Mid-Texas Commc’ns Sys., Inc. v. Am. Tel. & Tel. Co.*, 615 F.2d 1372, 1389 n.13 (5th Cir. 1980))); see also *Standard Oil Co. v. United States*, 221 U.S. 1, 61-62 (1911) (“[W]hen the [second] section [of the Sherman Act] is thus harmonized with . . . the [first], it becomes obvious that the criteria to be resorted to in any given case for the purpose of ascertaining whether violations of the section have been committed is the rule of reason guided by the established law . . . ”).

127. Apple argues that the rule of reason is inapplicable to its conduct in this case and that a “more specific” rule should apply, such as the duty to deal doctrine. (Legal Framework (ECF No. 276) at 57-58.) The law in this Circuit is clear, however, that Section 2 claims use “essentially the same” three-part burden-shifting test under the rule of reason as Section 1 claims. *See Qualcomm*, 969 F.3d at 991.⁶

128. One of the bases on which Apple argues for a different analytical framework is to urge the Court to view this case as a so-called “refusal to deal” case. (*See Legal Framework* (ECF No. 276) at 57.)

129. In a refusal to deal case, a plaintiff seeks to establish liability because of a firm’s refusal to engage in a transaction with the plaintiff. For example, in the paradigmatic refusal to deal case, *Aspen Skiing Co. v. Aspen Highlands Skiing Corp.*, 472 U.S. 585 (1985), a ski resort operator refused to participate with the plaintiff in selling a joint lift ticket package that covered its mountains and the plaintiff’s mountain. But the refusal to deal case law that Apple invokes applies only to *unconditional* refusals to deal, such as the ski resort operator’s flat refusal to sell a joint ticket. Such unconditional refusals to deal give rise to liability only in very narrow cases. *Verizon Commc’ns Inc. v. L. Offs. of Curtis V. Trinko*, LLP, 540 U.S. 398, 409 (2004); *Qualcomm*, 969 F.3d at 994.

130. If a defendant engages in a *conditional* refusal to deal, however, the “refusal to deal” framework does not apply. *Kodak*, 504 U.S. at 463 & n.8; *Lorain J. Co. v. United States*, 342 U.S. 143, 155 (1951); *Microsoft*, 253 F.3d at 70-73; *United States v. Dentsply*

⁶ The Court discusses Section 1 in greater detail below. (*See* § V below.)

Int'l, Inc., 399 F.3d 181, 188-90 (3d Cir. 2005). In a conditional refusal to deal case, courts will examine the specific conditions that the defendant imposes and the effects that those conditions have on competition.

131. Here, the unconditional refusal to deal framework does not apply. Apple willingly dealt with Epic for years, and Apple willingly deals with countless other app developers. Epic's claims center on conditions that Apple places on its willingness to deal. In particular, Apple conditions developers' access to the iOS platform on developers' agreement to abide by Apple's rules, such as the rule prohibiting apps that act as storefronts and thus could compete with Apple on app distribution, the rule prohibiting apps that stream games, and (as discussed further below) the rule requiring Apple's IAP system to be used for in-app purchases of digital content. In essence, like countless other monopolists, Apple conditions its willingness to deal on developers' agreement to preserve Apple's exclusivity in certain markets. These allegations do not invoke the unique circumstances applicable to unconditional refusal to deal cases like *Aspen Skiing*. See *Kodak*, 504 U.S. at 463 n.8 (holding that defendant's willingness to deal with third parties only on condition that they do not deal with its competitors is not analyzed as a "unilateral refusal to deal").

132. Therefore, the Court analyzes Apple's conduct under the rule of reason.

133. Under the rule of reason, the plaintiff has the initial burden to "demonstrat[e the] anticompetitive effect" of the monopolist's conduct. *Qualcomm*, 969 F.3d at 991 (internal quotation marks omitted). If the plaintiff meets this burden, "then the monopolist may proffer a procompetitive justification for its conduct. If the monopolist asserts a procompetitive justification . . . then the burden shifts back to the plaintiff to rebut that claim. If

the plaintiff cannot rebut the monopolist’s procompetitive justification, then the plaintiff must demonstrate that the anticompetitive harm of the conduct outweighs the procompetitive benefit.”” *Id.* (internal quotation marks and citations omitted).

134. The Court concludes that Apple has engaged in conduct with significant anti-competitive effects (*see* § I.B.i below); Apple’s pro-competitive justifications are pretextual (*see* § I.B.ii below); and the anti-competitive effects of Apple’s conduct outweigh its procompetitive justifications (*see* § I.B.iii below).

i. Apple has engaged in conduct with significant anti-competitive effects.

135. “[T]he possession of monopoly power will not be found unlawful [under Section 2] unless it is accompanied by an element of anticompetitive *conduct*.” *Verizon Commc’ns v. Law Offices of Curtis V. Trinko, LLP*, 540 U.S. 398, 407 (2004); *Qualcomm*, 969 F.3d at 990; *see also Grinnell*, 384 U.S. at 570-71 (requiring “the willful acquisition or maintenance of that power as distinguished from growth or development as a consequence of a superior product, business acumen, or historic accident” for a Section 2 monopolization claim). The plaintiff must show “anticompetitive abuse or leverage of monopoly power, or a predatory or exclusionary means of attempting to monopolize the relevant market.” *Qualcomm*, 969 F.3d at 990 (internal quotation marks omitted).

136. An antitrust plaintiff need not “present direct proof that a defendant’s continued monopoly power is precisely attributable to its anticompetitive conduct”. *Microsoft*, 253 F.3d at 79. “To require that § 2 liability turn on a plaintiff’s ability or inability to reconstruct the hypothetical marketplace absent a defendant’s anticompetitive conduct would only encourage monopolists to take more and earlier anticompetitive action.” *Id.* Because “neither plaintiffs nor

the court can confidently reconstruct a product’s hypothetical technological development in a world absent the defendant’s exclusionary conduct”, ““the defendant is made to suffer the uncertain consequences of its own undesirable conduct””. *Id.* In this case, Epic proved that Apple “engaged in anticompetitive conduct that reasonably appears capable of making a significant contribution to maintaining monopoly power”; that is all that is required for the “court[] to infer ‘causation’”. *See id.* (internal quotation marks omitted).

137. As discussed above, Apple uses its near total control over the iOS App Distribution Market to entrench the App Store as the only distribution option and block all potential competitors.

138. The App Store is the only permitted channel for developers to deliver their iOS apps to the consumer. (Findings of Fact ¶¶ 259, 264.) Apple preinstalls the App Store on the home screen of every iPhone. (Findings of Fact ¶ 272.) Apple does not pre-install, or otherwise allow, any other competing app stores on iOS devices. (Findings of Fact ¶273.)

139. Apple’s contracts with developers prohibit the distribution of competing app stores as well as apps that have similar functions (*i.e.*, game streaming services). (Findings of Fact ¶ 264.) As part of its App Review process, Apple rejects and refuses to distribute apps that do not comply with these prohibitions. (Findings of Fact § V.E.) Further, Apple’s “FEAR team” has been tasked with preventing “illicit” distribution. (Findings of Fact ¶ 647.) Apple removes competing app stores from the iOS platform. (Findings of Fact § V.E.)

140. Contrary to Apple’s suggestion, the fact that some of Apple’s restrictions appear in contracts where Apple licenses intellectual property does not immunize the restrictions from antitrust scrutiny. “[N]either patent nor copyright holders are immune from antitrust

liability”. *Image Technical Servs., Inc. v. Eastman Kodak Co.*, 125 F.3d 1195, 1215 (9th Cir. 1997); *see New York ex rel. Schneiderman v. Actavis PLC*, 787 F.3d 638, 660 (2d Cir. 2015) (“[I]ntellectual property rights do not confer a privilege to violate the antitrust laws”. (internal quotation marks omitted)); U.S. Department of Justice and Federal Trade Commission, *Antitrust Guidelines for the Licensing of Intellectual Property* § 2.1 (2017) (“As with other forms of private property, certain types of conduct with respect to intellectual property may have anticompetitive effects against which the antitrust laws can and do protect.”).

141. Courts analyze anti-competitive effects where, as here, an intellectual property owner conditions access to its intellectual property on terms that discriminate against its competitors. *See, e.g., Microsoft*, 253 F.3d at 60-62 (ruling that conditions on which Microsoft licensed Windows to original equipment manufacturers were anti-competitive because they “reduced rival browsers’ usage share not by improving its own product but, rather, by preventing OEMs from taking actions that could increase rivals’ share of usage”); *Qualcomm*, 969 F.3d at 1002 (“If Qualcomm were to refuse to license its [standard essential patents] to OEMs unless they first agreed to purchase Qualcomm’s chips (‘no chips, no license’), then rival chip suppliers indeed might have an antitrust claim under both §§ 1 and 2 of the Sherman Act based on exclusionary conduct.”).

142. Apple also has designed technical restrictions into iOS that prevent the distribution of apps and app stores outside of the App Store. To install or run on iOS, all third-party apps must be validated and signed using an Apple-issued certificate, and Apple controls the way in which third-party developers obtain their code signing certificates. (Findings of Fact ¶ 268.)

143. Citing *Allied Orthopedic Appliances Inc. v. Tyco Health Care Grp. LP*, 592 F.3d 991 (9th Cir. 2010), Apple argues that these technical restrictions are product innovations, and therefore exempt from antitrust liability. (Apple’s 5/21/21 COL ¶ 252.) Apple’s argument conflates the security innovation of code signing with the policy decision of distribution exclusivity. Apple’s security experts recognized that code signing does not imply any particular method of distribution; instead, Apple made a policy decision to use code signing as a means to enforce its distribution monopoly. (Findings of Fact ¶ 590.) Although “product improvement by itself does not violate Section 2”, a policy decision like Apple’s is a clear example of “the monopolist abus[ing] or leverag[ing] its monopoly power in some other way when introducing the product”, which may give rise to Section 2 liability. *See Allied Orthopedic*, 592 F.3d at 999-1000.

144. Epic alleges that the foregoing conduct has significant anti-competitive effects. The Court agrees.

145. Anti-competitive effects are those that “harm the competitive *process* and thereby harm consumers. In contrast, harm to one or more *competitors* will not suffice.” *Qualcomm*, 969 F.3d at 990 (internal quotation marks and citation omitted).

146. A plaintiff can prove anticompetitive effects directly and/or indirectly. *Am. Express*, 138 S. Ct. at 2284. “Direct evidence of anticompetitive effects would be proof of actual detrimental effects on competition, such as reduced output, increased prices, or decreased quality in the relevant market.” *Id.* (internal quotation marks, alterations and citations omitted). “Indirect evidence would be proof of market power plus some evidence that the challenged restraint harms competition.” *Id.* (citations omitted).

147. Courts consider the combined anti-competitive effects of a defendant's conduct. *City of Anaheim v. S. Cal. Edison Co.*, 955 F.2d 1373, 1376 (9th Cir. 1992) ("[I]t would not be proper to focus on specific individual acts of an accused monopolist while refusing to consider their overall combined effect."). In a two-sided market, courts must take into consideration the effects of the defendant's conduct on both sides of the market. *Am. Express*, 138 S. Ct. at 2287.

148. “[S]ingle-sided businesses can compete . . . with a two-sided platform in a single market”. (Schmalensee Trial Tr. 1916:15-1917:5.) According to Professor Schmalensee, direct distribution, which is single-sided, competes with distribution through app stores as part of the same market where the platform owner does not forbid direct distribution. (Schmalensee Trial Tr. 1916:15-1917:5.)

149. There is strong evidence in the record that the technical and contractual restrictions that Apple imposes to prevent all competing app distribution on iOS devices have harmed the competitive process. On operating systems that do not have such restrictions—Windows, macOS, and Android in China—there is vigorous competition among multiple app distribution channels, including both two-sided app stores and single-sided direct distribution of apps from developer websites. If Apple did not totally foreclose competition on iOS, app distributors would similarly compete on iOS—as shown by these other operating systems and by various efforts to achieve competing distribution on iOS over the years, such as through streaming games. (Ex. Expert 1 (Evans) § VI.E.) For all these reasons, according to Professor Schmalensee, “the market at issue here” is “a hybrid market, consisting of both two-sided businesses or two-sided platforms and single-sided businesses”. (Schmalensee Trial Tr.

1916:15-1917:20.) Because “[t]he market in [*Ohio v. American Express*, 138 S. Ct. 2274 (2018)] was clearly composed of two-sided platforms”, the market here is different “as an economic matter”. (Schmalensee Trial Tr. 1916:15-1917:20.)

150. In the absence of competition for app distribution on iOS, Apple has behaved like a “sleepy monopolist” with respect to that aspect of its business. While Apple touts the innovation it has displayed over the years in various other areas, it has been slow to adapt or improve the App Store; it has invested little in the App Store; and it has provided limited distribution services and largely kept prices constant (or, in some cases, raised them) while earning more and more profits. (Evans Trial Tr. 1559:1-1563:12; Ex. Expert 1 (Evans) ¶¶ 186-198.) As a result, both consumers and developers in the iOS App Distribution Market have suffered anti-competitive effects.

151. Specifically, there is substantial evidence in the record of anti-competitive effects on consumers in the iOS App Distribution Market, including: (1) fewer app stores with fewer innovative features and less choice (Findings of Fact § V.A); (2) higher prices due to developers passing on Apple’s supra-competitive commission to consumers (Findings of Fact § V.B); (3) fewer apps and less innovative apps (Findings of Fact § V.C); and (4) increased consumer switching and “mixing-and-matching costs” from a lack of “middleware” (Athey Trial Tr. 1754:19-20; Ex. Expert 4 (Athey) ¶¶ 48-50; PX-407; PX-416; Findings of Fact § V.F).

152. There also is substantial evidence of anti-competitive effects on developers, including: (1) reduced output and less innovation due to Apple’s supra-competitive commission (Findings of Fact § V.C); (2) inferior store features as compared to potential alternatives (Findings of Fact § V.C); (3) higher costs due to slow app review and arbitrary

decisions and errors (Findings of Fact § XI.F); (4) lack of exposure for apps created by smaller developers (Findings of Fact § V.C); (5) poor customer service (Findings of Fact § VIII.C.); (6) the suppression of tools that would make it easier for developers to persuade consumers to switch to a competing platform, such as a multi-platform app store (Ex. Expert 4 (Athey) ¶¶ 55, 56, 58; Findings of Fact § V.F); and (7) Apple preferencing its own apps over competing third-party apps (Findings of Fact § V.D).

153. The Court finds that this evidence, discussed in more detail in the Findings of Fact, is strong evidence of substantial anti-competitive effects.

154. During trial, Apple repeatedly asserted that “Apple has never increased its commission level”. (*See, e.g.*, Schiller Trial Tr. 2804:18-20.) This assertion is incorrect because, as explained above, Apple has increased prices by expanding the scope of transactions to which its commission applies. (Findings of Fact ¶ 296.) Moreover, the fact that Apple has never increased its headline commission above 30% is more likely due to the intense and continuous litigation, regulatory and legislative pressure on the App Store business model than competitive constraints, which are minimal to nonexistent. (*See* Findings of Fact ¶ 131; Schmalensee Trial Tr. 1978:4-1980:8.)

ii. Apple’s procompetitive justifications are pretextual.

155. “[I]f a plaintiff successfully establishes a *prima facie* case under § 2 by demonstrating anticompetitive effect[s], then the monopolist may proffer a ‘procompetitive justification’ for its conduct.” *Qualcomm*, 969 F.3d at 991 (internal quotation marks omitted) (quoting *Microsoft*, 253 F.3d at 59). A procompetitive justification is “a nonpretextual claim that

[the defendant's] conduct is indeed a form of competition on the merits because it involves, for example, greater efficiency or enhanced consumer appeal.” *Id.*

156. Apple justifies its prohibition on alternative app distribution channels on iOS primarily by pointing to the supposed security benefits of funneling all apps through the App Review process. This is a pretext.

157. Apple’s own security experts, when tasked with creating a model that would allow Apple to safely and securely allow third-party apps on the iPhone, created a model that separates app signing and scanning from app distribution and expressly contemplated the possibility of distribution through channels other than the App Store. (Findings of Fact ¶¶ 590-591.)

158. Apple implements a similar model today on macOS; alongside the Mac App Store, Apple offers notarization—a process whereby Apple signs and scans apps for malicious content, but then sends the scanned app back to the developer for distribution through channels other than the App Store. Under this model, Apple considers macOS to be a secure platform, even though, as noted above, Apple does not prevent third-party distribution of apps on macOS like it does on iOS. The same model could be implemented on iOS; as Craig Federighi acknowledged, at the end of Apple’s current App Review process, Apple possesses a fully vetted app, and it is entirely Apple’s choice whether to propagate that app to its own App Store or send it back to the developer for distribution through another channel. (Findings of Fact ¶ 593.)

159. The evidence further shows that most security features for the iPhone are located at the operating system level. For example, Apple requires sandboxing on iOS, which creates restrictions for how an app can interact with the operating system, the device, and other

apps. Apple could continue to enforce such security mechanisms even if apps were distributed outside of the App Store. (Mickens Trial Tr. 2570:11-19; Federighi Trial Tr. 3481:20-23.) Other essential security functions performed at the operating system level include (1) address space layout randomization (“ASLR”); (2) W^X memory; and (3) secure booting. (Ex. Expert 5 (Mickens) §§ V.D, V.E.) These features are separate from App Review. (Ex. Expert 5 (Mickens) ¶ 47.) Thus, restricting app distribution is not necessary to achieve these security measures.

160. With respect to the App Review process specifically, the process is not an effective method of detecting security issues or preventing the distribution of malicious software. Legions of bad apps make their way into the App Store. They always have and always will. Many are described above in the Findings of Fact. (Findings of Fact § XI.H.) Apple’s App Review has no “secret sauce”. Instead, the manual portion of the App Review relies on a cursory review by human reviewers with no special qualifications. The automated portion of the App Review relies on automated tools, most of which are publicly available and well understood by the security community. (Findings of Fact § XI.I.) Apple could continue to utilize these tools even if it allowed distribution outside the App Store, as it does today through the notarization process on macOS. And if it chooses not to, the evidence shows that third parties could replicate (and potentially improve upon) both the human and automated features of Apple’s process. (Kosmynka Trial Tr. 1187:21-1188:11.)

161. Apple permits limited exceptions to its no “store within a store” policy and is not aware of any security issues introduced through these stores. (*See, e.g.*, PX-301; PX-305.) For example, the app *Roblox* allows consumers access to multiple user-generated games within

the *Roblox* world, none of which are reviewed by Apple. (Findings of Fact § V.E.) Between 2015 and 2018, another app store, *Tribe*, was available on iOS. (Findings of Fact ¶ 332.) Although Apple ultimately removed *Tribe* from iOS, that decision was not the result of any security issues with *Tribe*. (Findings of Fact ¶ 332.) In fact, Apple has not conducted any studies of whether third-party app stores increase the security risks to iOS users. (Findings of Fact ¶ 337.)

162. To the contrary, security could be a vector on which alternative app stores compete if they were allowed on iOS. Apple is not the only company capable of protecting users. Indeed, alternative app stores could very well achieve better security results on iOS than Apple alone. (Kosmynka Trial Tr. 1187:21-1188:11.) The evidence shows that due to the tremendous number of apps the App Store must ingest each week, reviewers spend little time reviewing each app; at the very least, a more highly-curated store could have reviewers spend more time on examining the ins and outs of a given app. (Findings of Fact ¶ 629.)

163. Apple also claims that its anti-competitive conduct is justified by its desire to protect its intellectual property and prevent free-riding. (Apple’s 5/21/21 COL ¶¶ 313-17.) While this goal can be a legitimate business justification, it can be rebutted if it is pretextual. *See Image Technical Servs.*, 125 F.3d at 1219 (“Neither the aims of intellectual property law, nor the antitrust laws justify allowing a monopolist to rely upon a pretextual business justification to mask anticompetitive conduct.”); (Malackowski Trial Tr. 3699:25-3700:10).

164. Here, Apple’s intellectual property justification is pretextual. (*See* Findings of Fact § X.) Apple’s expert on intellectual property conceded that he had “not offered any evidence or cited any evidence that demonstrates that the reason why Apple prohibits stores

within a store was tied to protecting its IP”. (Malackowski Trial Tr. 3692:18-21; *see* Malackowski Trial Tr. 3694:11-13.) That is because the evidence undermines this proposition. When the App Store was announced, Mr. Jobs explained that the 30% commission was to “pay for running the App Store”—not to compensate Apple for its intellectual property. (PX-880.21.) Apple’s decision to charge the 30% commission was untethered to the costs of intellectual property. (*See* Ex. Depo. 3 at 137:23-138:14, 140:10-15, 140:17-21, 140:24-141:3, 141:5-7 (Cue); Malackowski Trial Tr. 3662:13-17.) The agreement that requires developers to pay the 30% commission does not refer to the commission as a royalty (PX-2621.4-5 (Schedule 2) § 3.4), and Apple’s intellectual property expert agreed “it’s not a royalty” (Malackowski Trial Tr. 3697:12-18). Apple does not even know what intellectual property it licenses. For instance, the DPLA does not disclose this information, and no one at Apple told Apple’s intellectual property expert this information. (*See* Malackowski Trial Tr. 3666:23-3667:6, 3667:18-24, 3669:19-3670:7.) To take another example, Mr. Schiller acknowledged that “Apple has utilized a lot of open source software” to power innovations for which it claims credit, but he had no idea “which [innovations] specifically”. (Schiller Trial Tr. 2940:3-10; *see generally* Schiller Trial Tr. 2939:8-2950:23.) Further, Apple allows access to its intellectual property without payment in a variety of circumstances. For example, sellers of physical goods and services such as Uber and Lyft can access Apple’s platform without paying a 30% commission. (PX-201.2-5; PX-2790.12 (Guidelines) § 3.1.3(e).) In addition, under the Video Partner Program, iOS developers such as Amazon Prime Video, Altice One and Canal + can use third-party payment processors instead of IAP. (Ex. Expert 1 (Evans) ¶ 235.)

165. These facts prove that Apple’s professed concern for protecting its intellectual property is pretextual. *See Image Technical Servs.*, 125 F.3d at 1219-20 (rejecting Kodak’s intellectual property justification because “Kodak’s parts manager testified that patents ‘did not cross [his] mind’ at the time Kodak began the parts policy” and “Kodak did not differentiate between patented and nonpatented parts”); *Microsoft*, 253 F.3d at 63-64 (rejecting one of Microsoft’s intellectual property justification because Microsoft “never substantiates this claim”).

166. Finally, Apple asserts that its conduct (1) maintains quality and improves ease of access, (2) broadens consumer choice and increases output, and (3) enhances interbrand competition. (Apple’s 5/21/21 COL ¶¶ 307-31.) These justifications are pretextual because Apple has not proved that its *exclusive* control over app distribution on iOS furthers these purported benefits. As an initial matter, there is ample evidence in the record that the App Store provides poor services and therefore does not further these benefits at all. (*See, e.g.*, Findings of Fact § V.C.) But more importantly, Apple’s justifications demonstrate—at most—only that Apple *believes* its method of app distribution is superior to alternative methods, not why it should be the only method. These proffered benefits are all bases on which Apple could compete with alternative app distribution methods. As its CEO acknowledged, if consumers had choice, Apple would “have to differentiate in some way”. (Cook Trial Tr. 3935:1.) Nothing would stop consumers and developers from choosing the App Store if Apple competed on the merits.

167. For the foregoing reasons, the Court concludes that Apple’s procompetitive justifications are pretextual. Although the Court could conclude its analysis here

and find in Epic’s favor, the Court will move on to the next step of the analysis assuming, for the sake of argument, that Apple’s procompetitive justification is not pretextual.

iii. The anti-competitive effects of Apple’s conduct outweigh its procompetitive justifications.

168. There is one more step of the rule of reason analysis. “If the plaintiff cannot rebut the monopolist’s procompetitive justification, ‘then the plaintiff must demonstrate that the anticompetitive harm of the conduct outweighs the procompetitive benefit.’” *Qualcomm*, 969 F.3d at 991 (quoting *Microsoft*, 253 F.3d at 59). If “the monopolist’s conduct on balance harms competition”, it is “condemned as exclusionary for purposes of § 2”. *Microsoft*, 253 F.3d at 59.

169. Apple argues that this is not the law. Instead, Apple claims that balancing is inapplicable in a Section 2 case and that Epic’s only option is to show that the procompetitive justifications for Apple’s conduct are entirely pretextual. (Legal Framework (ECF No. 276) at 66.) Apple is wrong. The Ninth Circuit—and many other courts—have held that it is appropriate to balance procompetitive benefits against anti-competitive harms under Section 2. See *Qualcomm*, 969 F.3d at 991 (quoted above); *Microsoft*, 253 F.3d at 59 (quoted above); *Actavis*, 787 F.3d at 658 (“[The plaintiff] has shown that whatever procompetitive benefits exist are outweighed by the anticompetitive harms.”); *Viamedia, Inc. v. Comcast Corp.*, 951 F.3d 429, 480 (7th Cir. 2020) (“The trier of fact must first evaluate the evidence and determine whether Comcast’s procompetitive justifications outweigh the anticompetitive harms from its conduct.”). The cases upon which Apple relies do not stand for a contrary proposition. See *Behrend v. Comcast Corp.*, No. CIV.A. 03-6604, 2012 WL 1231794, at *19 n.31 (E.D. Pa. Apr. 12, 2012)

(acknowledging the balancing test but concluding that plaintiffs had waived their ability to rely on it); *Morris Commc'n Corp. v. PGA Tour, Inc.*, 364 F.3d 1288, 1295 (11th Cir. 2004) (failing to address whether the balancing test applied); *ACT, Inc. v. Sylvan Learning Sys., Inc.*, 296 F.3d 657, 670 (8th Cir. 2002) (same). This Court follows the Ninth Circuit's caselaw and will, therefore, apply the balancing test.

170. When balancing Apple's procompetitive justifications, the Court also considers whether Apple's conduct achieves those benefits "in an unnecessarily restrictive way". See *Cascade Health Sols. v. PeaceHealth*, 515 F.3d 883, 894 (9th Cir. 2008) ("Anticompetitive conduct is behavior that tends to impair the opportunities of rivals and either does not further competition on the merits or does so in an unnecessarily restrictive way."). Apple argues that there is no "less restrictive alternative" requirement in Section 2 cases. (Legal Framework (ECF No. 276) at 65 (citing *Image Tech. Serv. v. Eastman Kodak Co.*, 903 F.2d 612, 620 (9th Cir. 1990).) Focusing on whether or not there is a separate "less restrictive alternative" step in Section 2 cases elevates form over substance. Regardless of how the analysis is labeled, it makes no sense to credit Apple in the balancing step for the full scope of its procompetitive justifications when Apple has alternatives. Otherwise, trivial business justifications providing marginal benefit easily obtainable without harming competition could be argued to cleanse anti-competitive conduct harming millions or, in this case, billions of consumers, simply because they do not rise to the level of absolute pretext. Therefore, the Court will weigh Apple's procompetitive justifications in light of Apple's alternatives.

171. Apple does have less restrictive alternatives to achieve its alleged procompetitive benefit of security. Apple's experience with macOS, where it does not restrict

app distribution exclusively to the App Store, confirms that less restrictive alternatives exist. Apple believes that macOS is secure. Apple prominently advertises on its website that Mac users enjoy “Security. Built right in.” and “[d]ownload apps safely from the Mac App Store. And the internet.” And can do so “worry-free”. (PX-741.1, 5.) iOS and macOS are built using the same OS kernel, iOS includes many of the security functions that are part of macOS, and improves on some, most notably sandboxing. (Findings of Fact § XI.A.) Other macOS security features, including signing and certification, Gatekeeper, Xprotect and MRT, can be implemented on iPhones today. (Findings of Fact § XI.D.)

172. Apple will not be unduly burdened by Epic’s requested relief. In fact, Apple already allows for third-party app stores on macOS. As Mr. Federighi testified, Apple could in fact implement all the security mechanism in macOS on iOS. (Federighi Trial Tr. 3473:2-4.) Further, iOS was designed to allow alternative distribution mechanisms outside the App Store. As an internal Apple 2007 security white paper explains, “our model will allow for third parties to distribute their own applications”; it is “a policy decision as to whether Apple signed applications are posted to the online store, or we allow developers to distribute on their own”. (PX-877.3.)

173. The incremental security benefits of subjecting all iOS apps to Apple’s App Review are minimal. Epic’s computer science experts have demonstrated that the most important security mechanisms for iOS—sandboxing, ASLR, W^X memory and secure booting—are enforced by the operating system or device itself, rather than Apple’s App Review process. (Ex. Expert 5 (Mickens) ¶¶ 23-41.) At most, App Review provides an additional layer of security by filtering out obviously malicious or otherwise dangerous apps. (See Ex. Expert 5

(Mickens) ¶ 77.) But the record is replete with evidence that App Review regularly fails in this function too, and all manner of bad and malicious apps make it through App Review and into the App Store for consumers to download. (Findings of Fact § XI.H.) Further, the automated portions of Apple’s App Review could be retained as part of notarization, as on macOS. Finally, the limited security benefits provided by App Review could easily be replicated by third-parties (Apple itself acquired a third party to perform some of these functions). Apple’s App Reviewers do not have any special qualifications and typically spend only six to twelve minutes reviewing an app; and Apple’s automated tools, such as static and dynamic analyzers, are well-understood and frequently used by security professionals outside of Apple. (Findings of Fact ¶¶ 629, 658-660.)

174. Therefore, the Court gives Apple little credit in the balancing for its procompetitive security justifications.

175. To the extent that there is any residual procompetitive benefit to Apple’s conduct that cannot be captured by less restrictive alternatives, the anti-competitive effects of Apple’s conduct clearly outweigh those benefits. Epic has detailed at great length the many harms caused by Apple’s complete foreclosure of the iOS App Distribution Market. For example, Apple’s conduct results in higher prices for consumers; it reduces output and innovation by forcing developers to pay supra-competitive commissions and subjecting developers to the arbitrary and error-prone App Review process. (Findings of Fact § V.B, V.C.) This in turn reduces consumers’ choice of apps and app features. To take another example, Apple prefers its own apps over third-party developers’ apps in numerous ways, including by using App Review to block competitor apps and by programming the App Store search

function to prioritize Apple apps. (Findings of Fact § V.D.) Again, both developers and consumers are harmed because Apple’s practices make it harder for developers to deliver their apps to consumers. The list goes on. By contrast, Apple has offered nothing but the unsupported, entirely theoretical concern that opening up iOS to third-party distribution may result in marginally more bad apps than already exist on the App Store (*see* § II.B.ii above).

C. Apple’s conduct caused antitrust injury to Epic.

176. The third and final element of Epic’s Section 2 claim requires that Epic prove that Apple’s anti-competitive conduct caused Epic injury. The Court concludes that it did.

177. “[C]ausal antitrust injury is a substantive element of an antitrust claim”. *Somers v. Apple, Inc.*, 729 F.3d 953, 963 (9th Cir. 2013). “The four requirements for antitrust injury are ‘(1) unlawful conduct, (2) causing an injury to the plaintiff, (3) that flows from that which makes the conduct unlawful, and (4) that is of the type the antitrust laws were intended to prevent.’” *Feitelson v. Google Inc.*, 80 F. Supp. 3d 1019, 1027 (N.D. Cal. 2015) (quoting *Am. Ad Mgmt., Inc. v. Gen. Tel. Co. of Cal.*, 190 F. 3d 1051, 1055 (9th Cir. 1999)).

178. Epic has been injured as a would-be competing app distributor on iOS. Epic currently distributes apps on PCs and Macs through a curated app store called the Epic Games Store (“EGS”). (Sweeney Trial Tr. 121:23-25; Allison Trial Tr. 1198:18-20.) If EGS were permitted on iOS, Epic would compete with Apple in the iOS App Distribution Market. (Sweeney Trial Tr. 97:24-98:4 (“And finally our Epic Games Store business is harmed by Apple’s policies because we are barred from introducing a version of our store for iOS. So we can operate on PC and Mac, but we cannot, because of Apple’s policies, distribute apps on iOS, and that locks us out of a very large worldwide business we would love to be in.”).) This would

allow Epic to earn revenue from the distribution of third-party apps as well as to grow the EGS userbase to make it a more desirable storefront for consumers and developers alike. (Sweeney Trial Tr. 97:24-98:4, 274:8 (“We aspire to have a store on many platforms.”), 330:19-24 (“You can’t purchase a game on the Epic Games Store and then go to iOS, and if the game assist is also available on iOS—you won’t own the game on iOS. You’d have to buy it again through Apple’s store. So there is no cross-platform competition in many product categories because Apple prohibits it.”).) Due to Apple’s restrictions, however, Epic has been denied these benefits and has suffered antitrust injury. *See Am. Ad Mgmt., Inc. v. Gen. Telephone Co.*, 190 F.3d 1051, 1057 (9th Cir. 1999) (recognizing “potential entrants” as market participants that can suffer antitrust injury).

179. In addition, Epic has been injured as an app developer. Up until August 13, 2020, Epic distributed *Fortnite* and certain other apps to iOS user through Apple’s App Store. (Sweeney Trial Tr. 148:18-22.) Epic still distributes other game and non-game apps, such as *Houseparty*, through the App Store. (Sweeney Trial Tr. 116:8-14.) Absent Apple’s rules, Epic would distribute its apps through many different means, including from its website like it does on PCs, Macs, and Android, through EGS like it does on PCs and Macs, and through third-party iOS app stores. (Sweeney Trial Tr. 127:7-11.) By distributing its apps exclusively through the App Store, Epic has paid supra-competitive commissions and received worse service than it would receive in a competitive market. (Findings of Fact ¶ 39.)

D. Epic should not be denied relief based on Apple’s meritless affirmative defenses.

180. The analysis is not quite yet over. A defendant is permitted to plead affirmative defenses, which if proved shield the defendant from liability, even if the plaintiff has proved each element of its claim.

181. Apple has alleged a kitchen sink of affirmative defenses—27 in total. It has offered little to the Court by way of individualized explanation. (Apple’s Answer (ECF No. 66) at pp. 36-41.) None justifies denying Epic relief.⁷

- i. Unclean hands is not an affirmative defense to an antitrust action (Affirmative Defense 12).

182. Apple has alleged that Epic’s “claims for injunctive relief are barred, in whole or in part, by the doctrine of unclean hands”. (Apple’s Answer (ECF No. 66) at p. 40.)

183. “‘Unclean hands’ has not been recognized as a defense to an antitrust action for many years”. *Memorex Corp. v. Int’l Bus. Mach. Corp.*, 555 F.2d 1379, 1381 (9th Cir. 1977); *see Broadcom Corp. v. Qualcomm Inc.*, 2009 WL 650576, at *11 (S.D. Cal. Mar. 11, 2009) (“The defense of unclean hands does not apply to antitrust claims.”); *see also McMullen v. Hoffman*, 174 U.S. 639, 654 (1899); *Cont’l Wall Paper Co. v. Louis Voight & Sons Co.*, 212 U.S. 227, 262 (1909); *Perma Life Mufflers, Inc. v. Int’l Parts. Corp.*, 392 U.S. 134, 139 (1968); *Kaiser Steel Corp. v. Mullins*, 455 U.S. 72, 77 (1982). Thus, the Court denies Apple’s unclean hands defense as a matter of law.

⁷ Only certain of Apple’s many affirmative defenses are addressed here. Those that are not addressed were not seriously urged at trial and/or can be rejected without meaningful discussion.

184. Even if the doctrine of unclean hands could bar antitrust claims (which it cannot), Apple has not established the defense here on the facts.

185. To prevail on a defense of unclean hands, a defendant must prove by clear and convincing evidence that (1) “the plaintiff’s conduct is inequitable”, and (2) “the conduct relates to the subject matter of [the plaintiff’s] claims”. *Fuddruckers, Inc. v. Doc’s B.R. Others, Inc.*, 826 F.2d 837, 847 (9th Cir. 1987); *see TrafficSchool.com, Inc. v. Edriver, Inc.*, 653 F.3d 820, 833 (9th Cir. 2011).

186. “[D]etermining whether the doctrine of unclean hands precludes relief requires balancing the alleged wrongdoing of the plaintiff against that of the defendant, and ‘weigh[ing] the substance of the right asserted by [the] plaintiff against the transgression which, it is contended, serves to foreclose that right.’” *Northbay Wellness Grp., Inc. v. Bayries*, 789 F.3d 956, 960 (9th Cir. 2015).

187. Here, while it is true that Epic implemented direct payment without disclosing to Apple that it was doing so, Epic did so only because Epic knew that Apple would use its monopoly power to reject this version of *Fortnite* if Apple knew that it contained a payment processing interface that could provide users with more than one option for processing in-app payments. (Findings of Fact § IX.N.) The Court has found that Apple’s conduct is unlawful, and Epic’s efforts to gather facts to support its claims and challenge that unlawful conduct does not rise to the level of unclean hands.

ii. Epic’s claims are not barred by the FTAIA or international comity (Affirmative Defenses 6 and 7).

188. Apple has alleged two affirmative defenses based on the geographic scope of Epic’s claims. Both defenses fail.

a. *The FTAIA does not bar Epic’s claims.*

189. Apple has alleged that Epic’s “claims are barred, in whole or in part, by the Foreign Trade Antitrust Improvements Act, 15 U.S.C. § 6a, insofar as Plaintiff makes claims concerning transactions or alleged conduct involving trade or commerce with foreign nations outside U.S. jurisdiction”. (Apple’s Answer (ECF No. 66) at p. 37.)

190. Apple’s conduct does “involve trade or commerce [with] . . . foreign nations” to the extent that the scope of that conduct is worldwide. Apple requires developers to sign its primary developer agreement—the Apple Developer Program License Agreement (the “DPLA”)—worldwide; Apple applies the rules for its app review process, called the App Store Review Guidelines (the “Guidelines”), worldwide; and Apple blocks direct downloading of apps and app stores worldwide. (Findings of Fact ¶ 264, 268.)

191. But Apple is incorrect that the Foreign Trade Antitrust Improvements Act (“FTAIA”) bars Epic’s claims in whole or in part.

192. The FTAIA provides in full:

“Sections 1 to 7 of [the Sherman Act] shall not apply to conduct involving trade or commerce (other than import trade or import commerce) foreign nations unless—

(1) such conduct has a direct, substantial, and reasonably foreseeable effect—

- (A) on trade or commerce which is not trade or commerce with foreign nations, or on import trade or import commerce with foreign nations; or
 - (B) on export trade or export commerce with foreign nations, of a person engaged in such trade or commerce in the United States; and
- (2) such effect gives rise to a claim under the provisions of sections 1 to 7 of [the Sherman Act], other than this section.

If sections 1 to 7 of [the Sherman Act] apply to such conduct only because of the operation of paragraph (1)(B), then sections 1 to 7 of this title shall apply to such conduct only for injury to export business in the United States.” 15 U.S.C. § 6a.

193. The statute establishes a general proposition that the Sherman Act does not apply to conduct involving foreign trade but provides two broad exceptions that, when boiled down, demonstrate that the Sherman Act generally applies *except* to conduct that “adversely affect[s] *only* foreign markets”. *F. Hoffmann-La Roche Ltd. v. Empagran S.A.*, 542 U.S. 155, 161 (2004) (emphasis added); *see also id.* at 158 (explaining that the FTAIA “excludes from the Sherman Act’s reach much anticompetitive conduct that causes *only* foreign injury” (emphasis added)).

194. The FTAIA does not bar Epic’s claims for two independent reasons. *First*, Apple’s conduct falls within the exception contained in paragraphs (1)(A) and (2). *Second*, Apple’s conduct falls within the exception contained in paragraphs (1)(B) and (2).

195. **Paragraphs (1)(A) and (2):** Paragraph (1)(A) removes the general bar on conduct involving foreign trade where the “conduct has a direct, substantial, and reasonably foreseeable effect” on “trade or commerce which is not trade or commerce with foreign nations, or on import trade or import commerce with foreign nations”. 15 U.S.C. § 6a(1)(A).

196. A direct effect “follows as an immediate consequence of the defendant’s activity”, “without deviation or interruption”. *United States v. LSL Biotechnologies*, 379 F.3d 672, 680 (9th Cir. 2004). An effect is substantial if it “involves a sufficient volume of U.S. commerce” and is not “a mere ‘spillover effect’”. *Sun Microsystems Inc. v. Hynix Semiconductor Inc.*, 534 F. Supp. 2d 1101, 1110 (N.D. Cal. 2007). An effect is reasonably foreseeable if it would “have been evident to a reasonable person making practical business judgments”. *Animal Sci. Prods., Inc. v. China Minmetals Corp.*, 654 F.3d 462, 471 (3d Cir. 2011).

197. Here, as a result of Apple’s restrictions, Epic cannot offer its distribution services on iOS to other developers, whether foreign or domestic; distribute its apps on alternative app stores created by app distributors, whether foreign or domestic; or engage the services of in-app payment processors, whether foreign or domestic.⁸ The effect of this conduct is direct, as Apple’s conduct expressly prohibits alternative app stores and non-IAP payment methods. (Findings of Fact ¶¶ 264, 267, 353, 357.) The effect is also substantial, given the size of the app economy, the relevant markets, and Epic’s userbase. (Findings of Fact ¶ 437.) Finally, the effect is reasonably foreseeable, as Apple intends to foreclose alternative app stores and non-IAP payment methods, both domestic and foreign. (Findings of Fact ¶¶ 264, 267, 353, 357.)

⁸ The Court discusses Apple’s payment processing restrictions in more detail below (*see* §§ IV, V, VII), but references those restrictions here in the interest of not repeating the FTAIA analysis.

198. Paragraph (2) requires that the “effect gives rise to a claim under the provisions of sections 1 to 7 of [the Sherman Act]”. 15 U.S.C. § 6a. To show that an “effect ‘gives rise’ to the plaintiff’s injury”, courts apply a “proximate causation standard”, which means that causation must be sufficiently direct. *United States v. Hui Hsiung*, 778 F.3d 738, 758-59 (9th Cir. 2015) (quoting *In re Dynamic Random Access Memory (DRAM) Antitrust Litig.*, 546 F.3d 981, 987 (9th Cir. 2008)).

199. Under paragraph (2), the effect “gives rise to a claim under the provisions of sections 1 to 7 of [the Sherman Act]” because Epic’s claims arise in part from the fact that it cannot distribute its apps on alternative app stores or use non-IAP payment methods, whether foreign or domestic. (See §§ II.C, IV.B.iii.)

200. Because paragraphs (1)(A) and (2) of the FTAIA are satisfied, the statute does not bar Epic’s claims.

201. **Paragraphs (1)(B) and (2):** Even if Epic could not satisfy paragraphs (1)(A) and (2) (which it can), the FTAIA still would not bar Epic’s claim if Epic could satisfy Paragraphs (1)(B) and (2). Epic can satisfy these paragraphs as well.

202. Under paragraph (1)(B), Apple’s conduct “has a direct, substantial, and reasonably foreseeable effect . . . on export trade or export commerce with foreign nations, of a person engaged in such trade or commerce in the United States”. 15 U.S.C. § 6a(1)(B).

203. Epic exports apps worldwide on iOS and sells in-app content to foreign consumers, and, absent Apple’s anti-competitive conduct, would provide app distribution and in-app payment processing services worldwide on iOS. Therefore, Epic is engaged in export commerce. *See TI Inv. Servs., LLC v. Microsoft Corp.*, 23 F. Supp. 3d 451, 469 (D.N.J. 2014)

(holding that U.S. defendant’s sales of VoIP services to consumers in India constitute export commerce under the FTAIA).

204. Apple prevents Epic from exporting Epic’s apps and selling in-app content to foreign consumers through the channels of Epic’s choice, and prevents Epic from providing any app distribution and in-app payment processing services worldwide on iOS. (Findings of Fact §§ V.A, VI.D.) The effect of Apple’s conduct on export trade or commerce is direct, as Apple’s conduct expressly forecloses alternative app stores and non-IAP payment methods. (Findings of Fact §§ V.A, VI.D.) The effect is substantial, given the size of the app economy, the relevant markets, and Epic’s userbase. (Findings of Fact ¶ 437.) Finally, the effect is reasonably foreseeable, Apple intends to foreclose alternative app stores and non-IAP payment methods. (Findings of Fact §§ V.A, VI.D.)

205. Under paragraph (2), the effect “gives rise to a claim under the provisions of sections 1 to 7 of [the Sherman Act]” because Epic’s claim arises in part from the fact that Epic cannot export its apps or sell in-app content to foreign consumers through the channels of its choice, or provide any app distribution and in-app payment processing services worldwide on iOS. (See §§ II.C, IV.B.iii.)

206. Because paragraphs (1)(B) and (2) of the FTAIA are satisfied, the statute does not bar Epic’s claims.

b. The doctrine of international comity does not bar Epic’s claims.

207. International comity refers to the respect owed by one sovereign to another. Apple has alleged that Epic’s “claims are barred, in whole or in part, by the doctrine of

international comity, insofar as Plaintiff seeks injunctive relief affecting transactions and conduct occurring outside U.S. jurisdiction". (Apple's Answer (ECF No. 66) at p. 37.) Apple is wrong.

208. The Sherman Act may reach overseas to protect against domestic antitrust injury. "No one denies that America's antitrust laws, when applied to foreign conduct, can interfere with a foreign nation's ability independently to regulate its own commercial affairs. But our courts have long held that application of our antitrust laws to foreign anticompetitive conduct is nonetheless reasonable, and hence consistent with principles of prescriptive comity, insofar as they reflect a legislative effort to redress *domestic* antitrust injury that foreign anticompetitive conduct has caused." *Hoffmann-La Roche*, 542 U.S. at 165.

209. Courts in the Ninth Circuit consider a variety of factors when deciding how much deference to give foreign interests. "The elements to be weighed include the degree of conflict with foreign law or policy, the nationality or allegiance of the parties and the locations or principal places of businesses or corporations, the extent to which enforcement by either state can be expected to achieve compliance, the relative significance of effects on the United States as compared with those elsewhere, the extent to which there is explicit purpose to harm or affect American commerce, the foreseeability of such effect, and the relative importance to the violations charged of conduct within the United States as compared with conduct abroad."

Timberlane Lumber Co. v. Bank of Am., N.T. & S.A., 549 F.2d 597, 614 (9th Cir. 1976), superseded by the FTAIA on other grounds.

210. The United States' interests in this action are significant. Epic and Apple are both incorporated and headquartered in the United States (Findings of Fact ¶¶ 42, 425), and

the DPLA is governed by “the laws of the United States and the State of California”. (PX-2619 (DPLA) § 14.10.)

211. By contrast, Apple has not pointed to any conflict between Epic’s requested injunction and any foreign interests, much less provided evidence on the relative importance of such interests. Apple has not proved this defense.

iii. Epic has not failed to join an indispensable party (Affirmative Defense 11).

212. Apple has alleged that Epic “has failed to join all parties necessary for a just adjudication of their purported claims”. (Apple’s Answer (ECF No. 66) at p. 38.) Although it is not clear which parties Apple alleges are necessary, the Court understands that Apple alleges that Epic’s corporate affiliates are necessary parties. This is incorrect.

213. Federal Rule of Civil Procedure 19 “establishes two broad categories of required parties”. *Ward v. Apple Inc.*, 791 F.3d 1041, 1048 (9th Cir. 2015). *First*, “a party is ‘required’ if, ‘in that person’s absence, the court cannot accord complete relief among existing parties’”. *Id.* (quoting Fed. R. Civ. P. 19(a)(1)(A)). *Second*, a “party is required if: that person claims an interest relating to the subject of the action and is so situated that disposing of the action in the person’s absence may: (i) as a practical matter impair or impede the person’s ability to protect the interest; or (ii) leave an existing party subject to a substantial risk of incurring double, multiple, or otherwise inconsistent obligations because of the interest”. *Id.* (quoting Fed. R. Civ. P. 19(a)(1)(B)).

214. The party asserting the absence of a necessary party bears the burden of persuasion. *Makah Indian Tribe v. Verity*, 910 F.2d 555, 558 (9th Cir. 1990). Apple has not met its burden.

215. Epic's affiliates are not necessary parties under the first category. Epic's requested injunction restrains *Apple*, which is a party. The fact that Epic's affiliates may be benefited by the injunction does not make them necessary parties. As explained below, the Court can grant injunctive relief that affects persons beyond the parties. (*See Error! Reference source not found.* below.)

216. Further, Epic's affiliates are not necessary parties under the second category. Apple cannot be concerned that Epic's affiliates' absence will "as a practical matter impair or impede [their] ability to protect the[ir] interest". Fed. R. Civ. P. 19(a)(1)(B)(i). Nor will Apple be "subject to a substantial risk of incurring double, multiple, or otherwise inconsistent obligations" based on Epic's affiliates' absence. Fed. R. Civ. P. 19(a)(1)(B)(ii). Epic is not seeking any monetary damages in this case, and the injunctive relief it is seeking is the same as it would be if all of its affiliates were also plaintiffs here.

iv. Epic has not waived, and is not estopped from asserting, any claims
(Affirmative Defenses 18 and 19).

217. Apple alleges that "claims are barred, in whole or in part, by the doctrine of waiver [and estoppel], including because Plaintiff renewed the term of the License Agreement on June 30, 2020—the same day that its CEO Tim Sweeney contacted Apple to request a 'side letter' exempting Plaintiff from certain obligations under the License Agreement. Apple denied the request, and Plaintiff continued to enjoy the benefits of the License Agreement. Thus, the

doctrine of waiver bars Plaintiff’s claims, in whole or in part.” (Apple’s Answer (ECF No. 66) at pp. 39-40.) Neither defense applies here.

a. Waiver

218. “[W]aiver’ means the intentional relinquishment or abandonment of a known right. Waiver requires an existing right, the waiving party’s knowledge of that right, and the party’s actual intention to relinquish the right.” *Lynch v. Cal. Coastal Comm’n*, 3 Cal. 5th 470, 475 (2017) (citations and quotation marks omitted). “Waiver always rests upon intent. The intention may be express, based on the waiving party’s words, or implied, based on conduct that is so inconsistent with an intent to enforce the right as to induce a reasonable belief that such right has been relinquished.” *Id.* (citations and quotation marks omitted).

219. Epic did not waive its claims. On June 30, 2020, Epic asked Apple to permit alternative app stores and non-IAP payment methods on iOS. (PX-2457.1.) Apple subsequently rejected Epic’s requests. (Sweeney Trial Tr. 88:1-17.) On July 17, 2020, Epic responded that “Epic is in a state of substantial disagreement with Apple’s policy and practices, and we will continue to pursue this”. (PX-2458.1.) Epic entered into a renewal of the DPLA on June 30, 2020—before Apple rejected Epic’s requests and only because Apple required it in order for Epic to continue in the Developer Program. Apple’s argument that Epic intended to waive its claims against Apple is without evidentiary support.

b. Equitable estoppel.

220. “Equitable estoppel precludes a party from claiming the benefits of a contract while simultaneously attempting to avoid the burdens that contract imposes.” *Comer v.*

Micor, Inc., 436 F.3d 1098, 1101 (9th Cir. 2006) (quotation marks omitted); *accord Kramer v. Toyota Motor Corp.*, 705 F.3d 1122, 1128 (9th Cir. 2013).

221. To establish an equitable estoppel defense, Apple must prove that “(1) [Epic] was aware of the true facts; (2) [Epic] intended its representation to be acted on or acted such that [Apple] had a right to believe it so intended; (3) [Apple was] ignorant of the true facts; and (4) [Apple] relied on [Epic’s] representation to [its] detriment.” *Acri v. Int’l Ass’n of Machinists & Aerospace Workers*, 781 F.2d 1393, 1398 (9th Cir. 1986); *accord Strong v. Cty. of Santa Cruz*, 15 Cal. 3d. 720, 725 (1975). Equitable estoppel applies “where the conduct of one side has induced the other to take such a position that it would be injured if the first should be permitted to repudiate its acts.” *Old Republic Ins. Co. v. FSR Brokerage, Inc.*, 80 Cal. App. 4th 666, 678 (2000).

222. Apple’s argument that Epic should be equitably estopped from asserting its claims against Apple fails for similar reasons as waiver. Epic did not “intend[] its representation to be acted on” and Apple was not “ignorant of the true facts”, *Acri*, 781 F.2d at 1398, because Epic made no representation that it would not pursue its claims. Instead, Epic wrote the opposite: “Epic is in a state of substantial disagreement with Apple’s policy and practices, and we will continue to pursue this”. (PX-2458.1.) Further, Apple has not pointed to any evidence that it “relied on” the exchange in the summer of 2020 “to [its] detriment”. *Acri*, 781 F.2d at 1398.

v. Epic did not ratify, agree to, acquiesce in, or consent to Apple's conduct (Affirmative Defense 8).

223. Apple alleges that Epic's "claims are barred, in whole or in part, because of Plaintiff's ratification, agreement, acquiescence, authorization, or consent to Apple's alleged conduct, including by renewing the term of the License Agreement on June 30, 2020—the same day that its CEO Tim Sweeney contacted Apple to request a 'side letter' exempting Plaintiff from certain obligations under the License Agreement. Apple denied the request, and Plaintiff continued to enjoy the benefits of the License Agreement, thereby ratifying, agreeing to, acquiescing, authorizing, and/or consenting to Apple's alleged conduct." (Apple's Answer (ECF No. 66) at pp. 39-40.)

224. It is unclear which doctrine Apple seeks to apply here, and Apple states that "[r]atification, agreement, acquiescence, and consent are alternative formulations of waiver and estoppel". (Apple's 5/21/21 COL ¶ 542.8.) Regardless, the Court rejects this affirmative defense because Epic did not ratify, agree to, acquiesce in, or consent to Apple's conduct. In June 2020, Epic entered into a renewal of the DPLA because Apple required it. (Grant Trial Tr. 721:24-722:1.) There is no evidence that Epic intended to ratify, agree to, acquiesce in, or consent to Apple's conduct by this renewal. Nor is there any evidence that Apple understood Epic to have ratified, agreed to, acquiesced in, or consented to Apple's conduct by this renewal. To the contrary, Epic explained within weeks that "Epic is in a state of substantial disagreement with Apple's policy and practices, and we will continue to pursue this". (PX-2458.1.)

225. The Court rejects these affirmative defenses.

vi. The *Noerr-Pennington* doctrine does not apply here (Affirmative Defense 14).

226. Apple has alleged that Epic’s “claims are barred, in whole or in part, insofar as they challenge the exercise of rights protected by the First Amendment of the United States Constitution, by Article I, Section 3 of the California Constitution, and by the *Noerr-Pennington* doctrine”. (Apple’s Answer (ECF No. 66) at pp. 40-41.)

227. The *Noerr-Pennington* doctrine allows private citizens to exercise their First Amendment rights to petition the government without fear of antitrust liability. *See Eastern R.R. Presidents Conference v. Noerr Motor Freight, Inc.*, 365 U.S. 127 (1961); *United Mine Workers of Am. v. Pennington*, 381 U.S. 657 (1965).

228. As discussed in more detail below (*see § XIII.D* below), Apple seeks a declaration that the Developer Agreement and DPLA are lawful contracts, that Apple’s terminations of the Developer Agreement and DPLA with Epic were lawful, and that Apple has the contractual right to terminate the Developer Agreements and DPLAs with Epic’s affiliates. (Legal Framework, App’x A (ECF No. 276-1) at 8-9; *see also* Apple’s Answer (ECF No. 66) at p. 65.) Apple argues that this request for a declaration is protected by the *Noerr-Pennington* doctrine.

229. The *Noerr-Pennington* doctrine does not apply here because Epic does not argue that Apple’s request for this declaration violates the antitrust laws. Instead, Epic argues that Apple’s termination or threatened termination of these contracts (*i.e.*, Apple’s retaliation against Epic for implementing Epic direct payment) violates the antitrust laws. That Apple has sought a declaration does not immunize Apple’s underlying conduct from liability.

vii. Epic's claims are not barred by the statute of limitations nor the equitable doctrine of laches (Affirmative Defenses 9 and 17).

230. Apple alleges that Epic's "claims are barred in whole or in part by the statute of limitations applicable to its respective claims", or "by the doctrine of laches". (Apple's Answer (ECF No. 66) at pp. 38-39.) The Court concludes otherwise.

a. *Epic's claims are not barred by any statutes of limitations.*

231. Epic's claims are not barred by any statutes of limitations.

232. Statutes of limitations refer to the time period during which a claim must be brought. "Unlike damages claims under section 4 [of the Clayton Act], which are subject to section 4B's four-year statute of limitations, there is no statute of limitations for injunctive relief claims under section 16." *Oliver v. SD-3C LLC*, 751 F.3d 1081, 1085 (9th Cir. 2014).

233. Therefore, Epic's Section 2 claim is not barred by any statute of limitations because no such statute applies to them. *See id.*

b. *Epic's claims are not barred by laches.*

234. "Laches is an equitable defense that prevents a plaintiff, who with full knowledge of the facts, acquiesces in a transaction and sleeps upon his rights." *Danjaq LLC v. Sony Corp.*, 263 F.3d 942, 950-51 (9th Cir. 2001). A defendant must prove that (1) the plaintiff delayed in initiating the lawsuit; (2) the delay was unreasonable; and (3) the delay resulted in prejudice to the defendant. *Id.*

235. "Claims for injunctive relief . . . [under the Clayton Act] are subject to the equitable defense of laches". *Oliver*, 751 F.3d at 1085. "[I]n computing the laches period,

section 4B’s four-year statute of limitation is used as a guideline”. *Id.* at 1086 (internal quotation marks omitted).

236. Epic did not unreasonably delay pursuing its claims—there is simply no basis for an assertion of laches. Nearly all of the actions involving Epic in this case have occurred within the last four years. *Fortnite* launched on iOS in April 2018; EGS launched in December 2018; Epic entered into a renewal of the DPLA in June 2020; Epic launched Epic direct payment on iOS in August 2020; and Apple removed *Fortnite* from the App Store in August 2020. (Findings of Fact ¶¶ 447, 458, 528; Grant Trial Tr. 721:24-722:1.) Because Epic was “injured within the four-year limitations period”, “laches does not bar [its] federal antitrust claim”. *Oliver*, 751 F.3d at 1087.

237. Further, even if Epic had unreasonably delayed (which it did not), Apple suffered no prejudice. Citing no evidence, Apple asserts that “Epic induced Apple to continue to make significant investments in the App Store . . . for the past ten years”. (Apple’s 4/21/21 COL ¶ 574.) Apple pressed forward with the App Store business model because it was minting money—not because it believed that Epic (one of millions of developers) was content. In any event, Apple has been engaged in continuous litigation over the App Store since at least 2011, when a putative class of consumer plaintiffs filed suit in a related action. (*Pepper v. Apple Inc.*, Case No. 4:11-cv-06714-YGR-TSH (N.D. Cal.), ECF No. 1.) Any alleged delay by Epic in suing over related conduct could not have prejudiced Apple.

* * *

238. For the foregoing reasons, the Court does not sustain any of Apple’s affirmative defenses, and finds Apple liable for unlawfully maintaining its monopoly in the iOS App Distribution Market.

III. SECTION 2 OF THE SHERMAN ACT: APPLE’S DENIAL OF AN ESSENTIAL FACILITY IN THE IOS APP DISTRIBUTION MARKET (COUNT 2).

239. Epic alleges that Apple is a monopolist in an essential facility—the iOS operating system. According to Epic, access to iOS is necessary for app distributors to distribute apps on iOS, and Apple denies access to all distributors, thereby foreclosing competition in the iOS App Distribution Market. The Court agrees with Epic. This claim, a so-called “essential facility” claim, is an independent basis for Apple’s liability under Section 2.

240. The Ninth Circuit has consistently recognized essential facility claims under Section 2 of the Sherman Act. *Aerotec Int’l, Inc. v. Honeywell Int’l, Inc.*, 836 F.3d 1171, 1185 (9th Cir. 2016); *MetroNet Servs. Corp. v. Qwest Corp.*, 383 F.3d 1124, 1128-29 (9th Cir. 2004); *City of Anaheim v. S. Cal. Edison Co.*, 955 F.2d 1373, 1379 (9th Cir. 1992).

241. The legal elements of an essential facility claim under governing Ninth Circuit precedent are undisputed. (Legal Framework (ECF No. 276) at 68.) To establish such a claim, a plaintiff must show that (1) the defendant is “a monopolist in control of an essential facility”; (2) the plaintiff “is unable reasonably or practically to duplicate the facility”; (3) the defendant “has refused to provide [the plaintiff] access to the facility”; and (4) “it is feasible for [the defendant] to provide such access”. *Aerotec*, 836 F.3d at 1185; *Metronet*, 383 F.3d at 1128-29; *Alaska Airlines, Inc. v. United Airlines, Inc.*, 948 F.2d 536, 542-46 (9th Cir. 1991). Epic has met its burden on each of these elements.

242. Epic has proved that (1) Apple is a monopolist in control of the iOS platform, which is an essential facility in the iOS App Distribution Market (§ III.A); (2) it is not possible for Epic reasonably or practicably to duplicate the iOS platform (§ III.B); (3) Apple has refused to give Epic access to the iOS platform in Epic's capacity as a potential app distributor (§ III.C); and (4) Apple could feasibly provide Epic with access to the iOS platform for the purpose of distributing apps (§ III.D).

243. Epic, as a potential competitor of Apple with respect to the essential facility at issue here, has standing to bring this essential facility claim against Apple (§ III.E).

A. Apple is a monopolist in control of an essential facility—the iOS platform.

244. “Essential facility” is a term of art under the antitrust laws. “[W]hat makes a facility essential is not the nature of the facility itself, but the effect upon competition that withholding the facility might have.” *City of Anaheim*, 955 F.2d at 1380.

245. “A facility that is controlled by a single firm will be considered ‘essential’ only if control of the facility carries with it the power to *eliminate* competition in the downstream market.” *Alaska Airlines*, 948 F.2d at 544; *see also Aerotec*, 836 F.3d at 1184 (an essential facility is “critical[] to competition”).

246. Here, Apple plainly exercises complete control over the iOS platform. *See MCI Commc'n Corp. v. Am. Tel. & Tel. Co.*, 708 F.2d 1081, 1133 (7th Cir. 1983) (affirming jury verdict on essential facilities claim where defendant “had complete control” over the necessary facilities). Apple develops iOS. (DX-4581.004; Findings of Fact ¶¶ 45-46.) Apple installs iOS on only Apple devices, and does not license iOS to other original equipment manufacturers. (Schiller Trial Tr. 3107:12-13; Cook Trial Tr. 3885:17-18; Findings of Fact

¶ 166.) Apple establishes the terms and conditions upon which consumers and developers interact with iOS. (Findings of Fact § II.A.)

247. It is indisputable that Apple has the power to eliminate competition downstream—and that it in fact *does* eliminate competition downstream. Apple offers myriad downstream services such as Apple Music, Apple TV+, as well as app distribution; Apple currently uses its control over the iOS platform to eliminate competition in the downstream iOS App Distribution Market, but that is no different from Apple decreeing that it will not allow Spotify or Netflix on iOS because those apps compete with its own. According to Apple, that is exactly what Apple has not only the power to do, but the right under the law to do. That is not so.

248. Apple technologically blocks consumers from downloading native apps through any channel except the App Store. (Findings of Fact ¶ 259.) App distributors cannot compete by making apps available to consumers through a website. (Findings of Fact ¶ 268.) Apple also conditions all app developers' access to iOS on the developers' agreement to distribute their apps solely through the App Store. (Findings of Fact § IV.A.) Thus, developers with access to iOS are contractually prohibited from competing with Apple as app distributors.

249. Apple has intentionally created an ecosystem that rendered the iOS platform an essential facility: it has locked in consumers as well as developers, and it has eliminated all competitive options for downstream iOS App Distribution Market. Because app distributors cannot compete in the iOS App Distribution Market without access to iOS, iOS is an essential facility. *See Sumotext Corp. v. Zoove, Inc.*, Case No. 16-cv-01370-BLF, 2020 WL 127671, at *10 (N.D. Cal. Jan. 10, 2020) (denying summary judgment and allowing essential

facilities claim to proceed to trial where access to the facility was essential to compete in the market).

250. Apple has argued that its ownership of intellectual property, such as Apple's patents, copyrights, or trademarks related to iOS prevent this Court from finding that iOS is an essential facility. This argument is without merit.

251. Intellectual property rights provide their owner with the right to exclude others; nothing more. *See Siemens Med. Sol. U.S., Inc. v. St.-Gobain Ceramics & Plastics, Inc.*, 647 F.3d 1373, 1374-75 (Fed. Cir. 2011) (Lourie, J. concurring) ("As we have long recognized, however, each patent grants only a right to exclude."). It is now axiomatic, however, that "a patent does not necessarily confer market power upon the patentee". *Ill. Tool Works Inc. v. Indep. Ink, Inc.*, 547 U.S. 28, 46 (2006). Where there is no market power, conduct related to patents raises no antitrust concerns. Where a firm does have market power, however, the fact that it also has intellectual property rights does not give it free rein to misuse that power to harm competition. As this Court found at the preliminary injunction stage, "intellectual property rights do not confer a privilege to violate the antitrust laws". *Epic*, 493 F. Supp. 3d at 837 n.17 (internal quotation marks omitted). Indeed, the law is full of examples where courts condemn the misuse of market power over products or technologies that are protected by intellectual property rights. *See, e.g., Microsoft*, 253 F.3d at 63 (rejecting as "border[ing] upon the frivolous" Microsoft's argument that it had "an absolute and unfettered right to use its intellectual property as it wishes"); *Actavis*, 787 F.3d at 660 (affirming order granting preliminary injunction in antitrust case and rejecting defendant's argument that its patent gave it an "absolute and unfettered right to use its intellectual property as it wishes" (internal quotation

marks omitted)). Apple’s intellectual property gave Apple the right to prevent all third parties from writing apps for use on iOS. Apple chose not to exercise that right, but instead to make its intellectual property widely available to developers—as long as they commit not to compete with it on iOS app distribution. As a result, an aftermarket emerged in which Apple has monopoly power. Apple cannot escape the ramifications of its decision to open iOS and the market realities that decision created.

252. In sum, there is no legal principle that exempts iOS from the essential facility doctrine so long as all of the other elements have been met. *See Bellsouth Advert. & Publ’g Corp. v. Donnelley Info. Publ’g, Inc.*, 719 F. Supp. 1551, 1566 (S.D. Fla. 1988), *rev’d on other grounds*, 999 F.2d 1436 (11th Cir. 1993) (“Although the doctrine of essential facilities has been applied predominantly to tangible assets, there is no reason why it could not apply, as in this case, to information wrongfully withheld” because the “effect in both situations is the same: a party is prevented from sharing in something essential to compete”).

253. Therefore, the Court concludes that Apple is a monopolist in control of an essential facility.

B. Epic is unable to reasonably or practically duplicate the iOS platform.

254. The second element of an essential facility claim relates to the plaintiff’s ability to duplicate the facility. “A facility is ‘essential’ only if it is ‘otherwise unavailable and cannot be reasonably or practically replicated.’” *MetroNet Servs.*, 383 F.3d at 1129-30.

255. Epic cannot possibly duplicate the iOS platform. If Epic did go to the enormous lengths necessary to develop a competing smartphone operating system, by definition, it would give rise to an entirely different platform. Thus, doing so would not permit competition

in the iOS App Distribution Market because, as noted, apps developed for one operating system do not work on other operating systems. Apple is the sole gatekeeper for the iOS platform and without its permission, Epic cannot compete in the iOS App Distribution Market.

C. Apple has refused to provide Epic—as an app distributor—access to the iOS platform.

256. The third element requires that a plaintiff show that the defendant denied access to the alleged essential facility. *MetroNet Servs.*, 383 F.3d at 1129; *Aerotec*, 836 F.3d at 1185.

257. Here, Apple denies potential app distributors like Epic access to iOS outright. As explained above, Apple technologically blocks app distributors from making apps or app stores available on websites for download by consumers. (Findings of Fact ¶ 268.) Apple’s “FEAR team” has been tasked with preventing “illicit” distribution. (Findings of Fact ¶ 647.) When Epic requested that Apple permit Epic to distribute a mobile version of EGS that would distribute iOS apps to consumers, Apple refused. (Findings of Fact ¶¶ 524-525.)

258. Apple, of course, has provided Epic access to the iOS platform in Epic’s capacity as an app developer. But that is not the focus of Epic’s essential facility claim. Apple argues elsewhere that “the ‘crux’ of Epic’s complaint is that Apple’s conduct has unfairly injured its economic interest in that it may not distribute iOS apps through EGS”. (Apple’s 5/21/21 COL ¶ 624.) As noted, Apple conditions access to the App Store, and thus to iOS users, on the requirement that developers not compete with Apple in the downstream iOS App Distribution Market. (PX-2619 (DPLA) §§ 3.2(g), 3.3.2, 7.6; PX-2790 (Guidelines) § 3.2.2(i).) Apple vigorously enforces these agreements and removes apps from iOS that operate as app stores.

(Finding of Fact § V.E.) The fact that Epic is able to access the iOS platform as a developer, then, does not change the fact that Epic is not permitted to access the iOS platform as a competing app distributor.

259. Accordingly, Apple denies Epic access to the iOS platform.

D. It is feasible for Apple to provide access to the iOS platform.

260. For denial of access to give rise to liability, it must be technically and practicably feasible for the monopolist to give competitors access to its essential facility. *MCI*, 708 F.2d at 1133; *see also Hecht v. Pro-Football, Inc.*, 570 F.2d 982, 992-93 (D.C. Cir. 1977).

261. The Court finds that it is both technically and practically feasible for Apple to allow access. iOS already has the capability to permit third parties to make apps available to users directly, rather than the App Store. Apple's Developer Enterprise Program permits employers to distribute apps directly to their employee, without going through the App Store or Apple's App Review. (Findings of Fact ¶ 268.)

262. Again here, macOS is instructive. Apple allows app distributors to distribute apps to consumers outside of the Mac App Store on macOS. (Findings of Fact ¶ 305) Scott Forstall, the architect of iOS, testified that iOS was based on macOS (Ex. Depo. 4 at 57:2-5, 64:19-21 (Forstall)), and that while “the technical infrastructure . . . will allow for other distribution mechanisms”, it is not Apple’s “policy . . . to allow that” (Ex. Depo. 4 at 129:8-24, 130:5-12 (Forstall)). There is no evidence that it would be infeasible to change that policy now.

263. Finally, contrary to Apple's previous assertion (*see Legal Framework* (ECF No. 276) at 81), there is no requirement that, to prove feasibility, a plaintiff must prove that the defendant provided access to others in the ordinary course of business. The Ninth Circuit has

never adopted such a requirement. *See, e.g., City of Anaheim*, 955 F.2d at 1380 (discussing feasibility requirement without mentioning the monopolist’s “ordinary course of business”). Moreover, the out of circuit case on which Apple relies, *Laurel Sand & Gravel, Inc. v. CSX Transp., Inc.*, 924 F.2d 539 (4th Cir. 1991), did not establish such a rule but instead looked to the defendant’s prior practices as support for finding that the defendant “ha[d] articulated a number of legitimate business reasons for refusing” access. *Id.* at 545.

264. In any event, as described above, Apple does provide third parties access to the iOS platform through the Developer Enterprise Program in the ordinary course—albeit on the condition that they agree not to compete with Apple by distributing apps to consumers. (*See Federighi Trial Tr. 3411:21-3412:12; PX-2519.1.*)⁹

E. Epic has standing, as a potential competitor, to bring its essential facility claim.

265. Finally, the Court addresses Epic’s standing to bring an essential facility claim. Standing essentially asks the question of whether this plaintiff is the right type of plaintiff to bring the claim. The Court finds that Epic has standing.

266. Both current and potential competitors have standing to bring an essential facility claim. Apple itself acknowledged this principle in a related case. *See Pistacchio v. Apple Inc.*, Case No. 4:20-cv-07034-YGR (N.D. Cal.), ECF No. 37 at 18 (“Only actual or

⁹ Courts have noted that the fourth element of an essential facility claim “basically raises the familiar question of whether there is a legitimate business justification for the refusal to provide the facility”. *City of Anaheim*, 955 F.2d at 1380 (citations omitted). As explained above, Apple has no legitimate business justification for its refusal to provide Epic and other app distributors access to the iOS platform. (*See* § II.B.ii above.)

potential competitors of the defendant may claim access to an essential facility.” (internal quotation marks and citation omitted)).

267. Potential competitor standing furthers the purpose of the essential facility doctrine, which is to prevent the monopolist from “extend[ing] monopoly power from one stage of production to another, and from one market into another”. *City of Anaheim*, 955 F.2d at 1379 (internal quotation marks and citation omitted). Where, as here, the monopolist has foreclosed all competition in the downstream market, *only* potential competitors can further this purpose.

268. Accordingly, the courts of appeals regularly explain the doctrine in terms of both actual and potential competitors. *See, e.g., Ferguson v. Greater Pocatello Chamber of Com., Inc.*, 848 F.2d 976, 983 (9th Cir. 1988); *MCI*, 708 F.2d at 1147 n.100.

269. Here, Epic is a potential competitor of Apple in the iOS App Distribution Market. Epic has an app store—EGS—on both PCs and Macs, and would bring EGS to iOS but for Apple’s refusal of access to iOS. (Findings of Fact ¶¶ 524-525.) Therefore, Epic has standing as a potential competitor to bring its essential facility claim. *See Ferguson*, 848 F.2d at 983; *MCI*, 708 F.2d at 1147 n.100.

270. For the foregoing reasons, the Court holds that Apple has denied access to an essential facility in violation of Section 2.¹⁰

¹⁰ To the extent that Apple asserts as affirmative defenses to Count 2 the same affirmative defenses addressed above in the context of Count 1 (monopoly maintenance in the iOS App Distribution Market), the Court denies those affirmative defenses with respect to Count 2 (denial of essential facility in the iOS App Distribution Market) for the same reasons. (*See* § II.D above.)

IV. SECTION 2 OF THE SHERMAN ACT: APPLE’S MONOPOLY MAINTENANCE OF THE IOS IN-APP PAYMENT SOLUTIONS MARKET (COUNT 4).

271. After the App Store launched in 2008, certain developers followed a business model that would come to dominate the App Store. They made their apps available for free or for a modest fee, and then charged users for additional content available in their apps (“in-app purchases”). (Findings of Fact ¶ 116.) To manage these payments, developers were free to design their own user interface, select a payment processor, establish their own payment solution, and own all aspects of that interaction with their customer. (Findings of Fact ¶ 116.)

272. In 2009, Apple eliminated this flexibility and mandated that all developers offering in-app purchases of digital content use Apple’s own payment processing system, known as In-App Purchase (“IAP”). (Findings of Fact ¶¶ 119, 127, 296.) The IAP mandate usurped developers’ direct relationships with their customers and diverted all payments by consumers through Apple, which extracts a 30% commission, before passing on the remainder to the developer. (Findings of Fact ¶¶ 119, 127, 278, 296.) Developers—who had previously handled transactions in a variety of ways and for a fraction of the 30% that Apple now charged (Findings of Fact ¶ 116)—had two choices: accept Apple’s terms, or change their business model (either by ceasing to offer in-app purchases or by getting off iOS).

273. Apple’s enforcement of IAP is contractual. The evidence at trial demonstrated that it is not technically necessary. (Findings of Fact ¶ 367, § XII.) Indeed, the fact that the App Store was launched and opened to third parties before IAP was introduced demonstrates that developers had a way of completing in-app purchases before IAP existed. (Findings of Fact ¶¶ 116, 702.) Moreover, to this day, apps that sell physical goods and services,

such as clothing or ride shares, continue to manage payments outside the IAP system, using payment solutions of their choice.

274. The IAP requirement is an express provision of the DPLA, which specifies that, subject to exceptions not relevant here, no app may “provide, unlock or enable additional features or functionality” other than through IAP. (PX-2619 (DPLA) § 3.3.3.) The result of this prohibition is that developers are prohibited from using competing payment solutions for in-app purchases of digital content. To police this requirement, the “App Store Review Guidelines” make clear that apps will be rejected if they contain a competing payment solution for such purchases. (PX-2790 (App Store Review Guidelines) § 3.1.1; PX-2558 § 3.1.1.)

275. Epic alleges that by the foregoing actions, Apple has monopolized a separate aftermarket on the iOS platform—the iOS In-App Payment Solutions Market. The Court agrees.

276. The elements for a Section 2 claim are discussed above: monopoly power in a relevant market; willful maintenance of that monopoly; and injury to the plaintiff. (*See* § II above.) Epic has established each of these elements for its claim that Apple unlawfully maintains its monopoly in the iOS In-App Payment Solutions Market. (*See* §§ IV.A-C below.)

A. Apple possesses monopoly power in the iOS In-App Payment Solutions Market.

277. Epic has established that there is an aftermarket for solutions for accepting and processing payments for the purchase of digital content (the “iOS In-App Payment Solutions Market”) (§ IV.A.i below), and that Apple has monopoly power in this market (§ IV.A.ii below).

i. There is an aftermarket for solutions for accepting and processing payments for the purchase of digital content within iOS apps.

278. The legal standard for market definition is discussed above; it considers potential substitutes for the products at issue and the geographic scope of competition. (*See* § II.A.i above.)

279. The Court finds that the iOS In-App Payment Solutions Market is a properly defined market.

280. As noted, many developers monetize their apps by offering in-app purchases, and many consumers desire the additional content available for purchase within apps. Therefore, both consumers and developers demand seamless and convenient solutions for accepting and processing payments for digital content in apps. (Findings of Fact § VI.A.)

281. The evidence at trial demonstrated that the possibility of purchasing digital content outside of an app is not a substitute for in-app purchasing. In-app purchases are more convenient. Leaving the app to make a purchase generally takes additional time and requires additional steps, and so users prefer not to leave the app. Convenience is particularly important for in-app purchases, many of which are small or time-sensitive. An extended delay may cause the consumer to second-guess and no longer make the purchase, costing the developer sales. (Findings of Fact § VI.A.) As a result, in-app payment processing solutions are the only effective alternative for in-app purchases. Other solutions involve too much friction.

282. This type of friction also explains why the possibility of users purchasing in-app content on an iOS web browser or on other platforms, and transferring that content to iOS apps, does not discipline Apple. At trial, Apple offered evidence of a handful of apps that allow

such cross-platform functionality. Apple did not prove that the number of apps offering this functionality is significant, or point to any contemporaneous evidence that, when making decisions about IAP, Apple considers how users or developers might substitute to this functionality.

283. While it is true that Apple does not impose its IAP requirement on all app developers—and indeed requires developers that sell physical goods and services on iOS to use payment solutions other than IAP—that does not defeat Epic’s proposed market for payment solutions relating to digital content purchased within an app. That is because Apple targets developers who offer in-app purchases of digital content and is able to raise the price on those customers above a competitive level without causing sufficient substitution to make that price increase unprofitable. Developers of other apps, such as those that sell physical goods and services, are not a source of customers whose substitution would constrain the price increase. As the Department of Justice and Federal Trade Commission have explained in their Horizontal Merger Guidelines, “[i]f a hypothetical monopolist could profitably target a subset of customers for price increases”, then relevant markets can be “defined around those targeted customers, to whom a hypothetical monopolist would profitably and separately impose at least a SSNIP”. U.S. Dep’t of Justice & Fed. Trade Comm’n, Horizontal Merger Guidelines § 4.1.4 (2010).

284. The “targeted customers” here are developers who offer digital content for in-app purchase; for such developers, other forms of earning revenue from their apps are not sufficient substitutes to discipline a price increase. As noted, directing customers to make purchases outside the app would be a qualitatively different experience that would substantially decrease the volume of purchases. In any event, Apple expressly forbids app developers from

informing customers that making purchases of digital content outside the app is even an option. (PX-2790 (App Store Review Guidelines) § 3.1.1; PX-2558 § 3.1.1.) Likewise, ceasing to offer in-app purchases and moving to an advertising-based model would entail material changes to the app experience. To use *Fortnite* as an example, putting advertisements inside the game would fundamentally alter gameplay, dilute the immersive nature of the app and force changes on the game's aesthetic. (Weissinger Trial Tr. 1305:22-1306:7 ("Philosophically we just would never [offer in-app advertising]. Ads are a terrible experience").) Very few developers would find it an appropriate substitute to make such radical changes to their business model in response to a SSNIP on the price of payment solutions for in-app purchases. (Evans Trial Tr. 1603:19-1604:6; *see also* Weissinger Trial Tr. 1305:25-1306:7 ("This one is pretty easy to understand. If you have ever . . . watched a movie on cable and you've got an ad in your face every . . . ten minutes . . . versus just streaming something on Netflix from start to finish, I think it's pretty easy to see that that is a superior experience. The ad free experience is superior. That is *Fortnite* to the tee. We do not want that.").) Changing their business model to the sale of physical goods and services would of course be an even larger tectonic shift in their business, unlikely to occur in sufficient numbers to make a SSNIP unprofitable. Indeed, the fact that many developers utilize IAP today, even though under Apple's current guidelines an advertising-based business model could save them Apple's 30% commission, demonstrates that for the developers Apple targets, a wholesale shift of their business model is not a viable option.

285. Epic presented empirical economic evidence to establish the contours of the iOS In-App Payment Solutions Market. Here again, and unlike Apple, Epic's expert economist, Dr. Evans, performed a SSNIP test. Dr. Evans considered a situation in which Apple

did not impose its payment processing restrictions, and developers could choose between IAP and their own payment processing solutions. He assumed a 5% average fee for non-IAP payment processing solutions chosen by developers. He then considered what would happen if developers accounting for just 20% of in-app transactions would choose to use their own payment processing solutions, with those accounting for the remaining 80% of in-app transactions using IAP at Apple's 27.7% effective commission rate. That would decrease the average commission rate in the market to 23.2% (the weighted average of 5% and 27.7%). By eliminating that choice for developers, the hypothetical monopolist would maintain its 27.7% average commission, which is 19.4% higher—well above a SSNIP. The evidence showed that it is likely that developers accounting for far more than 20% of in-app digital content transactions would choose an alternative payment solution. (Ex. Expert 1 (Evans) ¶¶ 256-265.) After all, only the top 22 revenue-generating app developers would need to change payment solutions to hit 20% of transactions. (PX-1056.1.) If even more developers would switch in the absence of the IAP requirement, then a hypothetical monopolist of online payment solutions for iOS digital content apps would be able to increase the commission rate by even more than 19.4%. (Ex. Expert 1 (Evans) ¶ 262.) If just 30% of developers would otherwise switch, the effective price increase from the IAP requirement would rise to 32.5%. (PX-1056.1)

286. Apple contests Epic's proposed market definition by arguing that IAP is more than just a "payment processor", meaning that it is inappropriate to lump IAP into a mere "payment processing" market. (*See, e.g.*, Ex. Expert 8 (Schmalensee) ¶ 162.) Apple argues that IAP provides a host of other services besides just payment processing. (Ex. Expert 8 (Schmalensee) ¶ 149-154.) The Court finds that Apple is elevating nomenclature over substance.

Epic has shown that, absent the IAP requirement that Apple imposes, app developers would create or select alternative payment solutions, including but not limited to core payment processing functionality (which developers may very well outsource, as indeed Apple does for IAP). These solutions would compete on price, fraud and security controls, parental controls, ease of integration, speed, flexibility in payment credential (*e.g.*, credit card, debit card, carrier billing, proprietary services like AliPay, cryptocurrency), and so on. (Findings of Fact ¶¶ 352, 358-360.) To the extent that Apple contends that IAP can perform more functions or perform them better, that is a basis on which Apple can and should compete in a competitive market, rather than a basis to deny the existence of a relevant market.

287. Apple has demonstrated monopoly power in the iOS In-App Payment Solutions Market based in part on its demonstrated ability to raise the prices it charges developers. Apple's ability to profitably raise prices shows that the iOS In-App Payment Solutions Market is properly defined. *See U.S. Anchor Mfg., Inc. v. Rule Indus., Inc.*, 7 F.3d 986, 998-99 (11th Cir. 1993) (finding that "the ability to discriminate against a distinct group of customers by charging higher prices for otherwise similar products demonstrates the existence of market power with respect to that group"); *State of Ill. ex rel. Hartigan v. Panhandle E. Pipe Line Co.*, 730 F. Supp. 826, 900 (C.D. Ill. 1990), *aff'd*, 935 F.2d 1469 (7th Cir. 1991) (defining market "by reference to the capabilities of different types of end-users [of oil and gas]" to resist the exercise of monopoly power, leading to price discrimination).

288. The evidence at trial demonstrates that Apple's IAP commission far exceeds the levels charged by other payment solutions, including even payment solutions employed by iOS apps that sell physical goods and services, which average 5% or even less.

Moreover, Apple has in fact raised prices to developers: first, with the 2009 imposition of a 30% commission on in-app purchases, and again with the 2011 imposition of that commission on subscriptions (that previously had not been subject to a commission). (Findings of Fact ¶¶ 115-120, 128.) As discussed above, these prices have allowed Apple to generate a persistently high margin over a sustained period of time, further demonstrating its market power. (See § II.A.vi above.)

289. It is significant to the Court that Apple's own executives are unaware of price increases in IAP causing any switching at all. Eddy Cue (one of Apple's highest executives, present from the earliest days of the App Store and in charge of it for a number of years) and Matt Fischer (the head of the App Store) were unaware of any instances or studies showing that the increased cost of in-app purchases resulted in consumers switching from iOS to Android. (Findings of Fact ¶ 222.)

290. Finally, the iOS In-App Payment Solutions Market is a proper aftermarket of the Smartphone Operating System Market for the same reasons that the iOS App Distribution Market is a proper aftermarket. Without iOS, there would be no market for in-app payment processing solutions on iOS. And the restraints at issue apply only to the aftermarket, not the initial market for smartphone operating systems. Consumers do not contractually agree to obtain payment processing for in-app digital purchases only through IAP when they purchase an iPhone, and competition in the foremarket does not discipline Apple's anti-competitive practices in the aftermarket. (See § II.A.iv above.)

291. Like the Smartphone Operating System and iOS App Distribution Markets, the iOS In-App Payment Solutions Market is worldwide except for China. When

permitted to obtain their own payment processing services, developers, including Apple, generally contract with payment processors to provide service in many countries, which suggests that competition is worldwide. (Findings of Fact ¶ 355.) Moreover, IAP processes payments worldwide, and Apple's IAP requirements in the DPLA and Guidelines apply worldwide. (Findings of Fact ¶¶ 214-216.) China, however, is different because restrictions imposed by the Chinese government limit both payment processors' and developers' abilities to operate in China and have created an insular market. (Findings of Fact ¶¶ 217, 335.)

292. For the foregoing reasons, the Court concludes that the iOS In-App Payment Solutions Market is a properly defined aftermarket. It is worldwide, excluding China.

ii. Apple has monopoly power in the iOS In-App Payment Solutions Market.

293. The legal standard for monopoly power is discussed above. It is the ability to raise prices above those that would be charged in a competitive market. (See § II.A.v.)

294. Many pieces of evidence establish that Apple has monopoly power in the iOS In-App Payment Solutions Market.

295. *First*, Apple has a 100% market share, and imposes impenetrable barriers to entry by contractually prohibiting all alternative payment solutions for digital content. (Findings of Fact ¶¶ 367-370, 376.) “Monopoly power may be inferred from a firm’s possession of a dominant share of a relevant market that is protected by entry barriers.” *Microsoft*, 253 F.3d at 51.

296. *Second*, Apple charges supra-competitive prices in the iOS In-App Payment Solutions Market. Apple's commission is 30%, while the competitive level for Epic is

about 3%-5%. (Findings of Fact ¶ 371.) A firm’s ability to “profitably raise prices substantially above the competitive level” is also evidence of monopoly power. *Microsoft*, 253 F.3d at 51.

297. As noted above, even Apple’s Phil Schiller did not believe “that 70/30 will last that unchanged forever” because “someday we will see enough challenge from another platform or web based solutions to want to adjust our model”. (PX-417.1.) It is difficult to imagine a clearer admission of supra-competitive pricing.

298. Relatedly, Apple enjoys the freedom to price without any connection to costs. (Findings of Fact ¶ 371.) This, too, is evidence of monopoly power. *See, e.g., In re IBM Peripheral EDP Devices Antitrust Litig.*, 481 F. Supp. 965, 977 (N.D. Cal. 1979) (recognizing that a firm’s ability to “disregard cost” and “choose among a range of price options in order to achieve its profit goals” is indicative of monopoly power).

299. Apple’s assertion that its IAP commission is not supra-competitive because comparable commissions are charged by game console makers is unpersuasive. There are a number of reasons why this argument is without merit. To begin with, the Court has not been asked to—and does not—address the competitive situation relating to payment solutions used by developers of apps for gaming consoles and thus expresses no opinion, one way or the other, on whether those commissions are an appropriate benchmark for iOS commissions.

300. Importantly, Apple’s attempt to analogize itself to console makers wrongly conflates two radically different business models. As noted above, Apple launched the App Store not in order to make money from the distribution of apps (or from providing payment processing solutions for in-app purchases), but to maximize its sales of iPhones, which are the core of Apple’s business model and its main source of revenue and profits to this day. Gaming

consoles, by contrast, follow the exact opposite business model: gaming consoles are sold at approximately their manufacturing costs, as means to maximize the sale of apps, which is the core of the game console makers' business model and where they make most of their profits—specifically, through fees from developers. (Findings of Fact ¶ 297.) As Lori Wright, Vice President of Business Development for Gaming, Media, and Entertainment at Microsoft testified, "We sell the consoles at a loss. We subsidize every console." (Wright Trial Tr. 552:1-2; DX-5523.031.) Unlike iOS devices, which have many uses that can and do draw a wide range of consumers, gaming consoles are primarily a single-purpose device with a much narrower user base. It is therefore important for console manufacturers to be able to assure developers that there will be a sufficient number of users who buy the console for it to be worthwhile for the developers to undertake the considerable expenses associated with developing most console games (which are far more expensive to develop than typical iOS apps). (Findings of Fact ¶ 297.) To induce developers to make these investments to develop games, which often take months or even years to complete, one way that console manufacturers try to assure developers that there will be sufficient users is to sell the hardware at subsidized prices. (Findings of Fact ¶ 297.) By contrast, Apple's commission is not subsidizing other costs because, as noted, it is untethered to Apple's costs. Further, Apple makes significant profits on the sales of hardware. In 2019, the iPhone had \$142.4 billion in net sales and [REDACTED] billion in operating income. (PX-606.)

301. It is also significant to the Court that the evidence at trial demonstrated that the console makers actively engage in negotiations with app developers regarding various terms and conditions that Apple eschews. The fact and result of these negotiations demonstrates

that the relationship with console makers has more give and take, a balancing of power.

Negotiated contractual arrangements result in terms that collectively need to be considered in order to determine value and real costs. The 30% commission paid to console makers cannot be assumed as an apples to apples comparison to what Apple charges.¹¹

302. *Third*, for reasons stated elsewhere, Apple’s treatment of developers further demonstrates Apple’s monopoly power. (*See ¶ 122 above*); *see also Microsoft*, 253 F.3d at 57-58 (finding aspects of Microsoft’s behavior “difficult to explain unless Windows is a monopoly product” and noting that its “pattern of exclusionary conduct could only be rational if the firm knew that it possessed monopoly power”). Apple itself acknowledges that in-app purchasing “is almost completely driven by our developers, and the App Store does not participate in a meaningful way”. (PX-59.22.) But Apple still takes its 30%.

303. Apple argues that it “lacks monopoly power because it competes with companies like PayPal, Stripe, and Square, and occupies only a small fraction of the market”. (Apple’s 5/21/21 COL ¶ 336.) This argument fails because consumers and developers cannot turn to “companies like PayPal, Stripe, and Square” for the transactions at issue. The fact that Apple is able to exclude them from the relevant market with its contractual terms is further evidence of Apple’s monopoly power.

¹¹ For these and other reasons, Apple’s stated concern that this Court’s ruling in favor of Epic will doom the closed ecosystems of the major game consoles is misplaced. Notably, the only individual presently employed by a game console manufacturer to testify in this case—Lori Wright, Vice President of Business Development for Gaming, Media, and Entertainment at Microsoft—did not suggest that ruling in Epic’s favor would undermine Microsoft’s Xbox model.

304. The Court concludes that Apple has monopoly power in the iOS In-App Payment Solutions Market.

B. Apple willfully maintains its monopoly power.

305. The Court has found that Epic's market definition is proper, and that Apple has monopoly power in the iOS In-App Payment Solutions Market. As discussed above, the next step of the analysis is to consider whether Apple has engaged in anti-competitive conduct to maintain its monopoly. The Court analyzes this question under the rule of reason.

306. When the significant evidentiary record is placed against the legal standard, the Court concludes that Apple's conduct violates the rule of reason. Apple's conduct has significant anti-competitive effects on developers and consumers (§ VI.B.i below); Apple's procompetitive justifications are pretextual (§ VI.B.ii below); and the anti-competitive effects of Apple's conduct outweigh any alleged benefits (§ VI.B.iii below).

i. Apple's IAP requirement has significant anti-competitive effects.

307. Apple concedes that Section 3.3.3 of the DPLA and Guideline 3.1.1 require exclusive use of IAP for in-app payment processing of digital content. (Findings of Fact ¶¶ 367-368.)

308. These contractual restrictions are enforced by Apple's App Review process. During App Review, Apple rejects apps that do not comply with its IAP requirement. Since 2017, Apple has terminated thousands of developer accounts for introduction of non-IAP payment methods. (Findings of Fact ¶¶ 357, 370.)

309. Apple has used its monopoly power to retaliate against developers who have included an alternative payment processing system in their apps. Epic's August 2020

“hotfix” provided the Court with an example of this. Epic first sought permission to include its own payment processing system and when that request was denied (PX-2457.1; PX-2458.1; DX-4477.1; Sweeney Trial Tr. 88:1-17), enabled Epic direct payment in *Fortnite* on iOS without Apple’s permission. Not only did Apple remove *Fortnite* from the App Store, Apple threatened to terminate all of Epic’s and Epic’s affiliates’ Apple Developer Program accounts and revoke Epic’s access to tools necessary “to improve hardware and software performance of Unreal Engine on Mac and iOS hardware”. (DX-3460.003; Sweeney Trial Tr. 97:5-98:4 (“Apple has threatened to remove Epic’s ability and access to its APIs to continue developing the *Unreal Engine* for iOS and Mac devices, which would mean if we could no longer develop our software, then it would . . . become obsolete relatively quickly and we couldn’t provide proper support to our customers, and our customers would no longer rely on us as the supplier of that software”)).

310. Epic is not the only developer Apple has retaliated against in relation to the IAP requirement. In 2018, Netflix chose to evaluate the value that IAP conferred. It conducted tests to determine whether IAP was negatively impacting its business; it tested different geographies, some with IAP and some without; Apple responded with “punitive measures” intended to make Netflix “feel the pain”. (Findings of Fact ¶ 382.)

311. The legal standard for anti-competitive effects is discussed above. The Court looks to direct evidence, such as increased prices, reduced output, and reduced quality, as well as indirect evidence, which consists of market power plus some evidence that the challenged restraint harms competition. (*See* § II.B.i above.) There is both strong direct and indirect evidence in this case.

312. Apple has monopoly power, and expressly prohibits entry by any competing in-app payment processors for digital content on iOS. As a result, developers and consumers must use Apple’s one-size-fits-all IAP, must pay Apple’s supra-competitive commission, and cannot enjoy the benefits of innovation by other payment solutions. (Findings of Fact § VI.D.) This alone is sufficient indirect evidence to prove anti-competitive effects on developers and consumers. *See Microsoft*, 253 F.3d at 62 (finding anticompetitive effects where Microsoft “reduced rival browsers’ usage share not by improving its own product but, rather, by preventing OEMs from taking actions that could increase rivals’ share of usage”); *Macquarie Grp. Ltd. v. Pac. Corp. Grp. Ltd.*, No. 08-cv-2113-IEG-WMC, 2009 WL 539928, at *8 (S.D. Cal. Mar. 2, 2009) (“The exclusion of competitors from the market place has the anticompetitive effect of allowing defendant to charge supra-competitive prices and, additionally, reduces consumer options.”); *United States v. Visa U.S.A., Inc.*, 163 F. Supp. 2d 322, 408 (S.D.N.Y. 2001) (finding “defendants’ exclusionary rules restrict competition between networks and harm consumers by denying them innovative and varied products”); *see also In re Nat’l Collegiate Athletic Ass’n Athletic Grant-in-Aid Cap Antitrust Litig.*, 958 F.3d 1239, 1256-57 (9th Cir. 2020) (concluding district court properly found “significant anticompetitive effects in the relevant market” where “elite student-athletes lack any viable alternatives to [D1], they are forced to accept, to the extent they want to attend college and play sports at an elite level after high school, whatever compensation is offered to them by [D1] schools, regardless of whether any such compensation is an accurate reflection of the competitive value of their athletic services” (quoting *In re Nat’l Collegiate Athletic Ass’n Athletic Grant-in-Aid Cap Antitrust Litig.*, 375 F. Supp. 3d 1058, 1070 (N.D. Cal. 2019))).

313. There is also substantial direct evidence of anti-competitive effects.

314. As an initial matter, Apple has increased prices for in-app payment processing over time. In 2009, Apple began requiring IAP; prior to that time, developers could use other payment solutions for in-app purchases. (Findings of Fact ¶¶ 115-119.) At the time, Apple allowed book sellers to avoid IAP by offering users links to online stores where they could purchase books. (Findings of Fact ¶ 116.) In 2011, Apple extended its IAP requirements to subscriptions and eliminated book sellers' ability to include a "Buy" button in the app linking users to online stores, again expanding the reach of IAP and eliminating alternative payment solutions. (Findings of Fact ¶ 128.) There is also evidence that developers pass on Apple's commission to consumers, resulting in increased prices to consumers. (Findings of Fact ¶¶ 338-39, 394.) Increased prices are classic direct evidence of the injurious exercise of market power. As the Supreme Court found in a related case, "A claim that a monopolistic retailer (here, Apple) has used its monopoly to overcharge consumers is a classic antitrust claim." *Apple Inc. v. Pepper*, 139 S. Ct. 1514, 1519 (2019); *see also Wilk v. Am. Med. Ass'n*, 895 F.2d 352, 360-62 (7th Cir. 1990) (finding that impeding consumers' free choice and raising costs were anti-competitive effects).

315. Apple argues that "[u]sing third-party payment processors would be *more* expensive for developers because they would have to pay" "both those processor fees *and* Apple's commission". (Apple's 5/21/21 COL ¶ 348; *see also id.* ¶ 457.) Apple misunderstands Epic's requested remedy, which the Court adopts below. Although Apple may charge a royalty for its intellectual property, Apple may not "impos[e] a financial penalty . . . on . . . iOS apps . . . that use payment processing solutions other than or in addition to Apple's IAP". (App'x 1.)

Because Apple will be unable to use its royalty to discriminate based on a developer’s choice of payment solutions, Apple will have to charge a separate price for use of its payment solution.

See Qualcomm, 969 F.3d at 997 (finding no antitrust violation where “Qualcomm’s current royalty rates . . . are based on the patent portfolio chosen by the OEM customer regardless of where the OEM sources its chips”). As a result, Apple will have to compete on the merits, including price, against other providers of payment solutions.

316. There is evidence that Apple’s IAP requirements have resulted in decreased output. Some small businesses cannot afford to absorb Apple’s commission rate, and cannot afford to pass the costs on to consumers without losing users. (Findings of Fact ¶¶ 390-393.) As Steve Jobs, Apple’s founder, acknowledged in an email about enforcing the IAP requirement, Apple’s commission “is prohibitive for many things”. (PX-438.)

317. Finally, there is significant evidence of decreased quality.

318. *First*, Apple’s IAP requirement prevents developers from controlling their relationships with their customers and must rely on Apple to resolve any payment disputes over transactions. This disconnect between customers and developers leads to confusion and complaints. (*See* Findings of Fact § VIII.C.)

319. *Second*, Apple’s IAP requirement deprives developers of access to key payment analytics, such as fraud reports or authorization rates broken down by payment method and country. Access to such information would allow developers to improve user experiences and safety. (*See* Findings of Fact § VIII.E.)

320. *Third*, Apple’s IAP requirement prevents developers from setting different prices across different countries. Instead, developers are required to select prices for products from a list of “price tiers” provided by Apple. (Findings of Fact § VIII.F.)

321. *Fourth*, Apple’s IAP requirement prevents consumers from having more flexible payment options. For example, the App Store permits carrier billing only in certain countries or regions and through certain carriers and their partners. Yet, many consumers find carrier billing to be a convenient way to pay because, among other reasons, it does not require a credit card. (Findings of Fact § VIII.G.)

322. *Fifth*, Apple’s IAP requirement results in consumers experiencing difficulty in obtaining refunds, as developers cannot directly refund consumers for purchases of digital content. (Findings of Fact §§ VIII.C-D.)

323. *Sixth* and finally, Apple’s IAP requirement prevents consumers from taking advantage of multi-platform payment processors. Multi-platform payment processors would provide many benefits to consumers, including persistent parental control settings and saved payment credentials, which consumers can use across different platforms, reducing switching costs between iOS and Android. (Findings of Fact § VIII.G.) For example, when Apple tried to require apps that provide “Membership Subscriptions” to use IAP, the developer of one such app, Uber, informed Apple that it did not understand how IAP could fit “in the context of [its] business model”. (PX-2235.4.) Uber explained, among other things, that IAP would be “impossible to sustain” because of the commission, would “create additional burden” due to the multi-platform nature of the Uber app, would result in a “poor user experience” given the fact that Uber already has a global in-house customer service support network and would

have to inform riders of a “unique customer support policy for iOS”, and “could create security risks” as Uber would have to share data with a third party. (PX-2235.4.)

324. Even Apple’s own employees recognize that IAP is not worth the 30% commission. In the words of one Apple employee conducting an assessment of developers who attempted to use non-IAP payment methods, IAP “would have to be a LOT better [than non-IAP payment methods] to overcome the 30% hit”. (PX-0257.1.)

ii. Apple’s procompetitive justifications are pretextual.

325. As discussed above, after the plaintiff proves anti-competitive effects, the burden shifts to the defendant to put forth procompetitive justifications. (See § II.B.ii above.)

326. Apple has asserted four procompetitive justifications for its IAP requirement: security, compensation for its investments, providing better service to consumers, and improving product quality for developers. All are pretextual.

a. *Security justifications are pretextual.*

327. Apple asserts that an important benefit of the IAP structure is the protection of security and privacy, including fraud detection. (Ex. Expert 11 (Rubin) ¶¶ 125-29; Ex. Expert 8 (Schmalensee) ¶ 149.) The evidence does not support this assertion.

328. Apple already permits non-IAP payment solutions for “Multiplatform Services”, “Enterprise Services,” “Person-to-Person Services”, “app[s] that enable[] people to purchase physical goods or services that will be consumed outside of the app”, and “Free Stand-Alone Apps”. (PX-2790 (Guidelines) § 3.1.3.) There is no evidence that the alternative payment solutions in these apps have caused security issues. (Findings of Fact § XII.A.) There is no

evidence that allowing alternative payment solutions for apps that currently fall outside of these Apple-created exceptions would in fact result in meaningful security issues.

329. Indeed, before Apple imposed its IAP requirement in 2009, non-IAP payment solutions were used by developers to service payments for digital content. There is no evidence that using those methods for those apps created any security issues. (Findings of Fact ¶¶ 115-119, 707.)

330. Apple itself relies on the security of third-party payment service providers, including PayPal and Chase. (Findings of Fact ¶¶ 31, 708.) If allowed to provide these same services to app developers or competing iOS app stores, these same providers or developers themselves could perform the other functions that Apple's IAP system currently performs (*e.g.*, providing refunds to consumers) for purchases of digital products, just as they do today for physical goods and services. The fact that Apple contracts with third-party payment settlement providers suggests Apple itself trusts the security they provide. Thousands of companies—including Grubhub, Wish, StubHub, Uber, DoorDash, Lyft, Instacart, Postmates, Amazon Shopping, Walmart, eBay, Amazon Prime Video, Altice One, and Canal+—already trust third-party payment systems such as Square and Stripe to securely process transactions on iOS. (Findings of Fact ¶ 359.)

331. Further, having Apple stand in the middle of developers and payment processors through IAP does not ensure security. Money laundering, refund fraud, and payment fraud are all prevalent issues with IAP. (Fischer Trial Tr. 897: 25-898:19; Findings of Fact ¶ 648) Matt Fischer, Vice President of the App Store, acknowledged that the App Store has seen

fraudulent refunds relating to app or in-app purchases even through 2019. (Fischer Trial Tr. 898:16-19; *see* Findings of Fact ¶ 648.)

332. Apple has not conducted any studies comparing the security or privacy of non-IAP payment solutions to IAP or the security or privacy of third-party payment processors in general. Nor has Apple conducted studies regarding potential security issues that would arise were Apple to allow developers to alternative payment solutions. (Findings of Fact ¶ 715.)

333. In fact, third-party payment processors may provide better security than Apple. Apple has failed to consider that third party payment solution providers, like PayPal, may have better fraud detection techniques by virtue of having more data points from a broader set of transactions processed, including purchases of physical goods as well as purchases that take place outside of the iOS ecosystem. (Findings of Fact ¶¶ 715, 717.)

334. Further evidence that Apple's justification is pretextual is evident in the record with regard to Epic direct payment. Epic direct payment is Epic's own payment processing service. It has been used for a number of years for in-app purchases on other platforms (for instance, on PCs). It is a proven, safe and secure system that complies with appropriate payment industry standards. To safeguard customers' payment credentials, Epic stores the details with its third-party payment partners, and internal Epic teams conduct security checks of the infrastructure. (Findings of Fact ¶¶ 547-548.) In August 2020, Epic turned on the Epic direct payment functionality within iOS. The *Fortnite* app on iOS has had Epic direct payment as a payment option ever since, and it is undisputed that Apple has not found any security issues in Epic direct payment. It is reasonable to assume Apple looked very hard to find some. Moreover, there is no evidence in the record that the introduction of Epic direct payment

to iOS in August 2020 caused any security or privacy issues on any iOS device on which it was used. (Findings of Fact ¶ 549.)

335. The Court concludes that Apple's procompetitive justification of security is pretextual.

b. Apple's justifications based on investments in iOS are pretextual.

336. Apple's second alleged procompetitive justification for its exclusionary conduct with respect to the iOS In-App Payment Solutions Market is based on obtaining "a return on its investments in intellectual property". (Ex. Expert 8 (Schmalensee) ¶ 130.) There is no doubt that Apple is entitled to get paid and set a price for the services it provides. However, the IAP requirement is unnecessary to achieve this. This justification is also pretextual.

337. As noted above, when the App Store launched in 2008, Steve Jobs, Apple's founder, said that "we don't intend to make money off the App Store . . . we are basically giving all the money to the developers here and if that 30% of it pays for running the store, well that will be great". (PX-880 at '801.) Mr. Jobs did not suggest that the commission was necessary to compensate Apple for its investments in iOS or to drive future investment in the iOS ecosystem. Apple has invented this justification after the fact to defend its conduct.

338. The evidence demonstrates that there are a number of ways in which Apple obtains revenue from the iOS ecosystem. First and foremost, Apple's sales of hardware are immensely profitable. In fiscal year 2019, Apple earned \$164 billion in net sales from iOS devices, and [REDACTED] from commissions on in-app purchases. (PX-608.77.) Thus, although Apple's revenue from IAP is significant, it represents a small fraction of the total revenue Apple earns from the iOS ecosystem. Epic's economic evidence demonstrated that even without the

IAP requirement, Apple would still command substantially higher profit margins than other online platforms. (Ex. Expert 16 (Evans) ¶ 72 (describing how Apple could still compete “on the merits” in the absence of these restrictions).)

339. The evidence also demonstrates that an elimination of the IAP requirement would not eliminate Apple’s incentives to continue to invest in the iOS ecosystem. All successful platform providers make developer tools widely available to attract third-party developers. (Findings of Fact ¶ 99; Apple Ex. Depo. 5 at 99:29-100:5 (Penwarden).) Apple has acknowledged that “[a]n ecosystem including third party apps made our products more attractive”. (PX-314.5.) Apple’s desire to sell iPhones provides sufficient incentive to continue to invest in iOS. (Findings of Fact § II.E.)

340. The Supreme Court recently recognized that Google faces a similar incentive with respect to Android:

“Google envisioned an Android platform that was free and open, such that software developers could use the tools found there free of charge. Its idea was that more and more developers using its Android platform would develop ever more Android-based applications, all of which would make Google’s Android-based smartphones more attractive to ultimate consumers. Consumers would then buy and use ever more of those phones. That vision required attracting a sizeable number of skilled programmers.”
Google, 141 S. Ct. at 1190 (citation omitted).

341. Moreover, eliminating the IAP requirement would not foreclose Apple from continuing to make money through app distribution and in-app purchases. Apple could continue to offer IAP to developers and charge for its use, but it would face competition in doing so and therefore need to provide a service that is competitive in terms of both quality and price.

342. Apple's experts provide no evidence that Apple's restrictions are necessary to eliminate free-riding or achieve any other benefits. (Ex. Expert 16 (Evans) ¶¶ 72-74.) Free-riding can occur when people use a resource in a way that denies the owners of the resource the intended benefit of such use, thereby relying on the investments of such owners without compensating them. Dr. Evans demonstrates that, as an economic matter, free-riding is not present here. Instead, both Apple and developers benefit from the indirect network effects that result from their engaging in joint behavior that provides value to the iOS platform. (Findings of Fact § II.E; Ex. Expert 16 (Evans) ¶¶ 73-74.) Apps that offer in-app purchases of digital content would no more be "free-riding" than apps that are currently exempt from the IAP requirement, such as apps that sell physical goods and services and apps that earn money from advertising. As noted above, Apple opened up the iPhone to third party app developers not to profit from the commissions paid by such developers, but to "sell more iPhones". (Findings of Fact ¶¶ 86-94, 103.)

343. Apple also asserts that the IAP requirement is justified as a convenient means for Apple to collect its commission. This argument begs the question whether Apple is entitled to a commission in this particular form and amount, which is a matter that should be determined by a competitive market rather than by Apple's exercise of market power. To be clear, Epic does not claim, and the Court does not find, that the use of IAP is inefficient or improper in *any* circumstances; indeed, Apple compels the use of IAP in the Mac App Store, and Epic raises no claim of impropriety in that regard. The issue here is simply that the compelled use of IAP is anti-competitive given Apple's market power in the iOS App Distribution Market; absent that market power, Apple's use of IAP for transactions on the App Store would

presumably be competitively benign, as developers who wished to avoid IAP could simply elect to distribute their apps through other channels.

344. Finally, the benefits of the iOS ecosystem asserted by Apple must be viewed in a broader context. It is true that the iPhone has brought many benefits to consumers and developers. But Apple has not shown that the success of the app economy resulted from Apple's monopoly over app distribution or its IAP requirement. Apple has no doubt contributed to the app economy. But so have countless others, including developers like Epic that are harmed by Apple's conduct. The question at issue in this case is not whether Apple has generally provided benefits to consumers and developers, but rather whether the *specific conduct at issue* provides such benefits or, instead, harms competition. On that question, the Court sides with Epic.

345. This is not the first time that Apple has tried to defend anti-competitive conduct by pointing to unrelated innovations. In the ebooks litigation (Findings of Fact ¶ 65), Apple argued that “iPad’s backlit touchscreen, audio and video capabilities, and ability to offer consumers a number of services on a single device revolutionized tablet computing”. *United States v. Apple, Inc.*, 791 F.3d 290, 335 (2d Cir. 2015) (Livingston, J. concurring). After Apple appealed a loss of that case, the Second Circuit affirmed. *Id.* at 298. Judge Livingston declined to find that these features justified Apple’s conduct, stating that they were “unrelated to Apple’s [anti-competitive conduct]”, and that the district court “was correct not to score these hardware innovations as procompetitive benefits” because “Apple was not the only entity that could use the iPad’s new features to enhance the ebook experience—other retailers, or the publishers themselves, could have designed and launched ebook applications on the platform”. *Id.* at 335

(Livingston, J. concurring). Here too, just as other firms could distribute apps on the iOS platform, other firms could provide payment solutions for in-app purchases of digital content in iOS apps.

346. For the foregoing reasons, the Court concludes that Apple’s “investment” procompetitive justification is pretextual. *See Areeda & Hovenkamp, Antitrust Law ¶ 1764a* (4th ed. 2020 Supp.) (explaining that the “Recovery of investment” defense to tying is unpersuasive because “[i]f the defendant cannot recover its investment in an unrestrained market, the market presumably tells us that its product is not worthwhile”). Here, it is clear that Apple would continue to make hefty profits without the IAP requirement and would indeed continue to have a significant incentive to invest in the iOS ecosystem.

c. *Apple’s additional justifications are pretextual.*

347. Apple offers two additional justifications: (1) providing better service to consumers, and (2) improving product quality for developers. (Apple’s 5/21/21 COL ¶¶ 363-67.) These are not procompetitive justifications for excluding alternative in-app payment solutions; these are merely reasons why Apple believes its solution is superior. As an initial matter, there is significant evidence in the record that Apple’s solution is, in fact, inferior. (*See, e.g.*, Findings of Fact §§ VIII.C-G.) More importantly, while these justifications may be reasons why consumers and developers could *choose* to use IAP on the merits, they do not justify making IAP the *exclusive* payment solution for digital content on iOS.

iii. The anti-competitive effects of Apple’s conduct outweigh any benefits.

348. Apple’s procompetitive justifications are pretextual. The Court may stop there and find liability. However, even if Apple’s actions were not pretextual, Epic would

nonetheless prevail on the basis that the anti-competitive effects of Apple's conduct outweigh any benefits.

349. As noted above (*see* § II.B.iii above), the Court considers Apple's procompetitive justifications in light of its less restrictive alternatives. With respect to security, the evidence demonstrates that Apple could require that all payment solutions on iOS maintain minimum security features. Any uniform, minimum standards would ensure that rogue payment processors that may jeopardize users' data are not allowed. For example, Apple could require compliance with the Payment Card Industry Data Security Standard (PCI-DSS), which sets rigorous security requirements to prevent cardholder data loss as well as general requirements for the prevention, detection, and response to security incidents for all organizations accepting and/or processing payments. (Findings of Fact ¶ 546.) Epic's eCommerce system, as well as third-party payment systems such as Square and Stripe are all Level 1 PCI-DSS compliant, meaning they are required to adhere to the strictest security standards and are subject to audits of their security systems. (Ko Trial Tr. 805:18-25; Findings of Fact ¶ 546.)

350. With respect to compensation for its investments, as discussed above, there are a number of alternatives to requiring the use of Apple's IAP that would still allow Apple a profit. *See Image Tech. Serv., Inc. v. Eastman Kodak Co.*, 903 F.2d 612, 619 (9th Cir. 1990), *aff'd sub nom. Eastman Kodak*, 504 U.S. 451 ("[I]t is a less restrictive alternative for [the defendant] to structure its prices for equipment, parts, and service so that the price for which [the defendant] sells each of these reflects [its] investment costs in that area." (citations omitted)). Apple gets paid in a variety of ways already. (*See* Findings of Fact § II.A.) To the extent Apple is concerned about not receiving the *same level* of compensation if the IAP requirement is

removed, that is no defense—if Apple cannot obtain the same price in a competitive market, that is just further proof of its illegal conduct.

351. Apple has pointed to protection of its intellectual property rights as a defense of the IAP requirement. As the Court has explained above, intellectual property rights do not confer any immunity from the antitrust laws. (*See* ¶ 138 above.) An intellectual property holder cannot license its products on anti-competitive terms. *See Digidyne Corp. v. Data Gen. Corp.*, 734 F.2d 1336, 1338, 1343-44 (9th Cir. 1984) (rejecting defendant’s argument that its refusal to license its operating system except to purchasers of its CPUs was justified by the need “to recover its substantial investment in software research and development” because “defendant must recover the cost of [the operating system] development by pricing [the operating system] appropriately, not by tying it to a separate product” (citation omitted)); *Microsoft*, 253 F.3d at 63 (“Intellectual property rights do not confer a privilege to violate the antitrust laws.” (internal quotation marks omitted)).

352. The Supreme Court’s decision in *Google* is also instructive here. In that case, Oracle sued Google for incorporating some of Oracle’s copyrighted Java programming language into Google’s Android operating system. *Google*, 141 S. Ct. at 1190. The Court held that Google’s conduct was protected by the fair use doctrine. *Id.* The Court reasoned in part that “Android’s profitability has much to do with third parties’ (say, programmers’) investment in Sun Java programs. It has correspondingly less to do with Sun’s investment in creating the Sun Java API.” *Id.* at 1208. Accordingly, the Supreme Court cautioned against allowing Oracle’s intellectual property to stifle the innovation of these third parties:

“[G]iven programmers’ investment in learning the Sun Java API, to allow enforcement of Oracle’s copyright here would risk harm to the public. Given the costs and difficulties of producing alternative APIs with similar appeal to programmers, allowing enforcement here would make of the Sun Java API’s declaring code a lock limiting the future creativity of new programs. Oracle alone would hold the key. The result could well prove highly profitable to Oracle (or other firms holding a copyright in computer interfaces). But those profits could well flow from creative improvements, new applications, and new uses developed by users who have learned to work with that interface. To that extent, the lock would interfere with, not further, copyright’s basic creativity objectives.” *Id.*

353. So too here. The effort and creativity of third-party developers has contributed significantly to the value of iOS. The Court should not allow Apple to use its intellectual property to “monopolize the market by making it impossible for others to compete”. *Id.* (internal quotation marks omitted).

354. For the foregoing reasons, the Court gives little weight to Apple’s competitive justifications. To the extent that there are any procompetitive benefits to Apple’s conduct that cannot be achieved by other means that do not harm competition, the anti-competitive effects of Apple’s conduct outweigh these procompetitive benefits. *See Microsoft*, 253 F.3d at 64; *Actavis*, 787 F.3d at 659. Epic has detailed the many harms caused by Apple’s conditioning of access to app distribution on the use of Apple’s IAP, while Apple has nothing but theoretical concerns that it claims might arise in the absence of its restrictions. (*See* Evans Trial Tr. 1559:1-1563:12; Ex. Expert 1 (Evans) ¶¶ 269-285.)

355. The Court concludes that Apple’s conduct is anti-competitive.

C. Apple's conduct caused antitrust injury to Epic.

356. The final element of a Section 2 claim is antitrust injury. As explained above, the legal standard requires unlawful conduct causing an injury to the plaintiff that flows from that which makes the conduct unlawful, and that is of the type the antitrust laws were intended to prevent. (*See* § II.C above.)

357. Epic has been injured as a would-be provider of a competing payment solution. Epic offers a payment solution through Epic direct payment to apps distributed by EGS on PCs and Macs that choose to use Epic's solution. (Sweeney Trial Tr. 127:15-20 (“It's used as the default payment method in the Epic Games Store for Windows and Mac . . .”), 128:13-17 (“Epic introduced Epic Direct Payment into *Fortnite* on iOS. And it is a general service that we would like to make available to other developers in the future if we were allowed to.”); Ko Trial Tr. 799:22-25.) After recognizing that Apple and Google “had such dominance” in their respective markets, Epic sought to develop a world-class payment solution, adding currencies to reach users all over the world holding a competitive RFP process, and beginning development on innovative payment features for the benefits of consumers and developers. (Ko Trial Tr. 801:1-18; 801:23-802:20; 807:14-808:4; 818:5-15; *see also* Findings of Fact § IX.P.) Developers of apps distributed through EGS can also choose to use a competing payment solution. (Findings of Fact ¶ 488.) The Epic direct payment solution includes a variety of features like supporting regional pricing and accepting payments in 42 different currencies, combined with outsourced payment processing from providers like Chase, PayPal, and Adyen. (Findings of Fact ¶ 545.) If EGS were permitted on iOS and Apple did not require use of IAP, Epic would offer Epic direct payment to apps distributed by EGS on iOS, including both Epic's own apps and third-party

apps. Because Apple prohibits alternative payment processing solutions for digital content, Epic has lost revenue and the ability to compete with IAP. Epic, therefore, has suffered antitrust injury as a competitor to Apple. *See Am. Ad Mgmt., Inc. v. Gen. Telephone Co.*, 190 F.3d 1051, 1057 (9th Cir. 1999) (recognizing “potential entrants” as a market participant that can suffer antitrust injury).

358. In addition, Epic has been injured as an app developer. Epic self-supplies Epic direct payment to its own apps on PCs, Macs, and Android. (Findings of Fact ¶ 541.) As Epic’s actions on August 13, 2020 made abundantly clear, if Apple did not require use of IAP, Epic would not use IAP exclusively. (Sweeney Trial Tr. 128:14-15 (“So Epic introduced Epic Direct Payment into *Fortnite* on iOS.”), 158:7-8 (“So at the time we introduced the hot fix, we offered both Apple’s payment service and Epic’s side by side.”); Ko Trial Tr. 804:12-17 (Project Liberty was “an attempt to provide developer choices for payment solutions and bring that benefit to the customers in a platform where [that] choice is not available.”).) Epic would self-supply Epic direct payment on iOS, just as it currently uses it in first-party games on PC and sideloaded *Fortnite* on Android and used it during Project Liberty. (Ko Trial Tr. 799:22-25; 804:2-7; Sweeney Trial Tr. 128:14-15, 158:7-8.) By having to use IAP, Epic has paid supra-competitive prices, suffered from impaired customer relationships, and lost the benefits of choice and innovation that competition among third-party payment processors would bring. (See Findings of Fact §§ VIII.A, C, E, G & IX.P; Evans Trial Tr. 1609:16-1610:6.) As the Ninth Circuit has recognized, “[c]onsumers in the market where trade is allegedly restrained are presumptively proper plaintiffs to allege antitrust injury”. *Glen Holly Ent., Inc. v. Tektronix, Inc.*, 352 F.3d 367, 372 (9th Cir. 2003) (internal quotation marks omitted).

359. Therefore, the Court finds that Apple is liable for unlawful monopoly maintenance in the iOS In-App Payment Solutions Market in violation of Section 2 of the Sherman Act.¹²

V. SECTION 1 OF THE SHERMAN ACT: APPLE'S UNREASONABLE RESTRAINT OF TRADE IN THE IOS APP DISTRIBUTION MARKET (COUNT 3).

360. So far, the Court's opinion has addressed Apple's unilateral conduct under Section 2 of the Sherman Act. The Sherman Act also prohibits conduct involving two or more persons that unreasonably retrains trade. The Court now turns to this conduct.

361. Section 1 of the Sherman Act prohibits “[e]very contract, combination in the form of trust or otherwise, or conspiracy, in restraint of trade or commerce among the several States, or with foreign nations”. 15 U.S.C. § 1. “To establish liability under § 1, a plaintiff must prove (1) the existence of an agreement, and (2) that the agreement was in unreasonable restraint of trade”. *Aerotec Int'l, Inc. v. Honeywell Int'l, Inc.*, 836 F.3d 1171, 1178 (9th Cir. 2016).

362. “Restraints can be unreasonable in one of two ways. A small group of restraints are unreasonable *per se* because they always or almost always tend to restrict competition and decrease output. Typically only ‘horizontal’ restraints—restraints ‘imposed by agreement between competitors’—qualify as unreasonable *per se*. Restraints that are not unreasonable *per se* are judged under the ‘rule of reason’”, which “requires courts to conduct a

¹² To the extent that Apple asserts as affirmative defenses to Count 4 the same affirmative defenses addressed above in the context of Count 1 (monopoly maintenance in the iOS App Distribution Market), the Court denies those affirmative defenses with respect to Count 4 (monopoly maintenance in the iOS In-App Payment Solutions Market) for the same reasons. (See § II.D above.)

fact-specific assessment of market power and market structure . . . to assess the [restraint]’s actual effect on competition”. *Am. Express*, 138 S. Ct. at 2283-84 (alteration in original) (citations omitted). “The existence of market power is a significant finding that casts an anticompetitive shadow over a party’s practices in a rule-of-reason case.” *Hahn v. Oregon Physicians’ Serv.*, 868 F.2d 1022, 1026 (9th Cir. 1988).

363. Applying Section 1, the DPLA is an agreement that unreasonably restrains trade for purposes of Section 1.

364. The DPLA is an agreement between Apple and Epic. Apple also has DPLAs with hundreds of thousands, if not millions, of other developers.

365. The parties agree that “express ‘agreements’ are ‘direct evidence of concerted activity’ and satisfy the first element of a Section 1 claim”. (Legal Framework (ECF No. 276) at 23 (quoting *Paladin Assocs., Inc. v. Montana Power Co.*, 328 F.3d 1145, 1153 (9th Cir. 2003)); *see Sun Microsystems Inc. v. Hynix Semiconductor Inc.*, 608 F. Supp. 2d 1166, 1192 (N.D. Cal. 2009) (“One way of proving concerted action is by express agreement.”)). “A plaintiff ‘need not prove intent to control prices or destroy competition to demonstrate the element of an agreement among two or more entities.’” (*Id.* (quoting *Paladin*, 328 F.3d at 1153-54 (internal quotation marks and alterations omitted))).

366. An agreement can give rise to Section 1 liability even if it does not advance the interests of all parties and instead involves some form of coercion. *See, e.g.*, *Datagate, Inc. v. Hewlett-Packard Co.*, 60 F.3d 1421, 1427 (9th Cir. 1995) (“A showing that the buyer of the tied product was coerced by the tying arrangement into making the purchase is sufficient to show that the buyer was not merely ‘acting independently.’”); *Cargill Inc. v.*

Budine, No. CV-F-07-349-LJO-SMS, 2007 WL 4207908, at *3 (E.D. Cal. Nov. 27, 2007);
Packaging Sys., Inc. v. PRC-Desoto Int'l, Inc., 268 F. Supp. 3d 1071, 1085 (C.D. Cal. 2017).

The DPLA is an agreement within the meaning of Section 1. Apple cites cases supposedly to the contrary, but they involve challenges to policies adopted by one party, rather than contracts between two or more parties, like the DPLA. (See Apple's 5/21/21 COL ¶¶ 489-501.)

367. Further, the provisions of the DPLA requiring distribution of iOS apps through Apple's App Store and prohibiting alternative app stores—Sections 3.2(g), 3.3.2, and 7.6—constitute an unreasonable restraint of trade.

368. As noted above, the rule of reason requires the Court to consider the defendant's market power. The parties agree that “[m]arket power under Section 1 requires a lesser showing than monopoly power under Section 2”. (Legal Framework (ECF No. 276) at 26 (citing *Kodak*, 504 U.S. at 481.)

369. The Court has already found that the iOS App Distribution Market is a relevant antitrust market. Consumers and developers have no substitutes for app distribution on iOS because, among other reasons, apps and app stores developed for other operating systems do not work on iOS. (See § II.A.iii above.) The Court also found that Apple possesses monopoly power in the iOS App Distribution Market because, among other reasons, Apple has a 100% market share, high profit margins, and the ability to foreclose all competitors. (See § II.A.vi above).

370. Because the rule of reason analysis under Section 1 is “essentially the same” as the rule of reason analysis under Section 2, the Court will not repeat the analysis here.

See Qualcomm, 969 F.3d at 991.¹³ The Court previously found that Sections 3.2(g), 3.3.2, and 7.6 of the DPLA form one part of Apple’s unlawful conduct under Section 2. For the same reasons, those provisions an unreasonable restraint of trade under Section 1. (*See* § II above.) Therefore, the Court finds Apple liable for unreasonably restraining trade in the iOS App Distribution Market.¹⁴

VI. SECTION 1 OF THE SHERMAN ACT: APPLE’S UNREASONABLE RESTRAINT OF TRADE IN THE IOS IN-APP PAYMENT SOLUTIONS MARKET (COUNT 5).

371. Next, the Court applies Section 1 to the iOS In-App Payment Solutions Market.

372. As noted, Section 1 requires an agreement that constitutes an unreasonable restraint of trade. (*See* § V above.) A violation of Section 1 requires a showing that Apple’s conduct violates the rule of reason, which is evaluated under substantially the same standard described above. (*See* § II.B above.)

¹³ Apple disputes that the rule of reason test is applied in the same way under Sections 1 and 2 of the Sherman Act. For example, it contends that there is no “less restrictive alternative” component to the third step of the rule of reason under Section 2. Because all of the ways in which Apple contends the analysis differs make it less demanding to prove a Section 1 violation, the analysis above with respect to Section 2 necessarily means that Epic has shown a violation of the rule of reason under Section 1 as well. To the extent that any elements of the rule of reason analysis discussed above apply *only* to Section 1, the Court considers them as part of this Section 1 analysis and incorporates herein the discussion of those issues that appears above.

¹⁴ To the extent that Apple asserts as affirmative defenses to Count 3 the same affirmative defenses addressed above in the context of Count 1 (monopoly maintenance in the iOS App Distribution Market), the Court denies those affirmative defenses with respect to Count 3 (unreasonable restraint of trade in the iOS App Distribution Market) for the same reasons. (*See* § II.D above.)

373. The Court has found that the DPLA is an agreement for purposes of Section 1 (*see* § V above); that Apple has market power in the iOS In-App Payment Solutions Market (*see* § IV.A above); and that the DPLA's requirement that developers use Apple's IAP to the exclusion of all other payment processors for digital content violates the rule of reason (*see* § IV.B above).

374. Therefore, the Court concludes that Apple is liable for unreasonably restraining trade in the iOS In-App Payment Solutions Market.¹⁵

VII. SECTION 1 OF THE SHERMAN ACT: APPLE'S TIE OF APP DISTRIBUTION AND PAYMENT PROCESSING (COUNT 6).

375. Conduct may be *per se* unlawful under the antitrust laws when experience shows that the conduct is always or nearly always anti-competitive.

376. Tying can be an example of such conduct. Tying involves the linking of two separate products from two separate product markets. *Jefferson Parish Hosp. Dist. No. 2 v. Hyde*, 466 U.S. 2, 21 (1984), *abrogated on other grounds by Ill. Tool Works Inc. v. Indep. Ink, Inc.*, 547 U.S. 28 (2006).

377. Epic alleges that Apple's IAP requirement is a classic contractual tie. Apple conditions access to iOS app distribution on developers' agreement to use only Apple's IAP for in-app purchases of digital content. The Court agrees.

¹⁵ To the extent that Apple asserts as affirmative defenses to Count 5 the same affirmative defenses addressed above in the context of Count 1 (monopoly maintenance in the iOS App Distribution Market), the Court denies those affirmative defenses with respect to Count 5 (unreasonable restraint of trade in the iOS In-App Payment Solutions Market) for the same reasons. (*See* § II.D above.)

378. “For a tying claim to suffer per se condemnation, a plaintiff must prove: (1) that the defendant tied together the sale of two distinct products or services; (2) that the defendant possesses enough economic power in the tying product market to coerce its customers into purchasing the tied product; and (3) that the tying arrangement affects a not insubstantial volume of commerce in the tied product market.” *Cascade Health Sols. v. PeaceHealth*, 15 F.3d 883, 913 (9th Cir. 2008) (citation omitted); *see also Jefferson Parish*, 466 U.S. at 12-18; *Kodak*, 504 U.S. at 461-62.¹⁶

379. Apple has argued that the rule of reason, rather than *per se* analysis, should govern in tying cases where the tied good is “physically and technologically integrated

¹⁶ Apple has argued that there is a fourth element—a “pernicious effect” on competition in the tied market—for *per se* tying claims. (Legal Framework (ECF No. 276) at 46.) But Ninth Circuit precedent establishes that “the *per se* rule relieves plaintiff of the burden of demonstrating an anticompetitive effect, which is assumed”. *Newman v. Universal Pictures*, 813 F.2d 1519, 1522-23 (9th Cir. 1987); *Hirsh v. Martindale-Hubbell, Inc.*, 674 F.2d 1343, 1347 (9th Cir. 1982) (Once [the three *per se* tying] elements are established, a tying arrangement is presumptively illegal and will be prohibited without a specific showing of anticompetitive purpose or effect.”); *Betaseed, Inc. v. U and I Inc.*, 681 F.2d 1203, 1215 (9th Cir. 1982) (“Once [the *per se* tying elements] are demonstrated, no specific showing of unreasonable anticompetitive effect is needed.”); *see also Fortner Enters., Inc. v. U.S. Steel Corp.*, 394 U.S. 495, 498 (1969) (“[A]t least when certain prerequisites are met, arrangements of this kind are illegal in and of themselves, and no specific showing of unreasonable anticompetitive effect is required.”). Although certain district courts have considered whether tying conduct has a “pernicious effect on competition” in the tied product market, Apple has not identified any Ninth Circuit case adopting the “pernicious effect” requirement. That phrase derives from the Supreme Court’s decision in *Northern Pac. R. Co. v. United States*, 356 U.S. 1 (1958), which emphatically endorsed the *per se* treatment of tying, finding it to be among the “practices which because of their pernicious effect on competition and lack of any redeeming virtue are conclusively presumed to be unreasonable and therefore illegal without elaborate inquiry as to the precise harm they have caused”. *Id.* at 5. Even if there were a separate “pernicious effect” requirement for *per se* tying (which there is not), Apple’s tie meets that requirement because Epic has proven substantial anti-competitive effects in the iOS In-App Payment Solutions Market. (*See* § IV.B above.)

with the tying good". (Legal Framework (ECF No. 276) at 35 (quoting *Microsoft*, 253 F.3d at 90.) In *Microsoft*, the defendant technologically integrated its operating system with its web browser, and the court declined to condemn this technologically integrated product as *per se* unlawful for fear of chilling product innovation. *Id.* at 89-95. *Microsoft* is distinguishable for at least two reasons. *First*, as explained below, the App Store and IAP are not technologically integrated as Microsoft's operating system was with its web browser. The tie here is a contractual one, and the *Microsoft* court did not question the line of "Supreme Court tying cases" that apply the *per se* standard to "contractual ties". *See id.* at 90.

380. Apple's conditioning of access to the App Store on developers' use of IAP for in-app purchases of digital content meets each element of *per se* tying. (§§ VII.A-D below.) In the alternative, Apple's conduct violates the rule of reason. (§ VII.E below.)

A. Apple ties together the sale of two distinct products—app distribution and payment solutions.

381. As noted, the first element of a *per se* tying claim requires that the plaintiff prove that the defendant ties two separate products together. Here, app distribution and payment solutions for in-app purchases are separate products (§ VII.A.i) that Apple has contractually tied together (§ VII.A.ii).

- i. App distribution and in-app payment processing solutions are separate products.

382. "[T]he answer to the question whether one or two products are involved turns not on the functional relation between them, but rather on the character of the demand for the two items." *Jefferson Parish*, 466 U.S. at 19; *see also Rick-Mik Enters., Inc. v. Equilon Enters. LLC*, 532 F.3d 963, 975 (9th Cir. 2008). There must be "sufficient demand for the

purchase of [the tied product] separate from [the tying product] to identify a distinct product market in which it is efficient to offer [the tied product] separately from [the tying product]”.

Jefferson Parish, 466 U.S. at 21-22; *see also Rick-Mik*, 532 F.3d at 975.

383. “[T]he ‘purchaser demand’ test of *Jefferson Parish* examines direct and indirect evidence of consumer demand for the tied product separate from the tying product. Direct evidence addresses the question whether, when given a choice, consumers purchase the tied good from the tying good maker, or from other firms. Indirect evidence includes the behavior of firms without market power in the tying good market, presumably on the notion that (competitive) supply follows demand”. *Rick-Mik*, 532 F.3d at 975 (citations and internal quotation marks omitted).

384. Apple asserts that IAP and the App Store are an integrated product, and that app distribution cannot be separated from the solution that is used to handle subsequent in-app purchases. (Defendant Apple Inc.’s Opposition to Epic Games, Inc.’s Motion for a Preliminary Injunction (ECF No. 73) at 18-20.) The record does not support this position. Instead, the evidence shows demand for alternative payment solutions on iOS separate from the demand for app distribution on iOS.

385. Apple’s position suggests an organic, integrated development—that as the App Store developed, so too did IAP. This is contradicted by several facts in the trial record. During the time between the launch of the App Store in 2008 and the introduction of IAP in 2009, in-app payment processing and app distribution were entirely separate and iOS developers were monetizing their apps with purchase solutions that were self-provided. (Findings of Fact ¶¶ 115-119, 127.)

386. The history of IAP undercuts Apple’s claim of a necessarily integrated product, as other aspects of the evidentiary record further support the independence of these two products.

387. *First*, Apple provides both app distribution without payment solutions, and payment solutions without app distribution.

388. Apple provides distribution services through the App Store without requiring use of IAP for “Multiplatform Services”, “Enterprise Services,” “Person-to-Person Experiences”, “app[s] [that] enable[] people to purchase physical goods or services that will be consumed outside of the app”, and “Free Stand-Alone Apps”. (PX-56 (Guidelines) § 3.1.3; Findings of Fact ¶ 713.)

389. The evidence shows that for categories of apps for which Apple does not require the use of IAP, developers offer their own payment methods. Many of the most significant apps, including Grubhub, Wish, StubHub, Uber, DoorDash, Lyft, Instacart, Postmates, Amazon Shopping, Walmart, eBay, Amazon Prime Video, Altice One, and Canal+, procure payment processing services from sources other than Apple, *i.e.*, separately from the distribution services they are forced to obtain from the App Store. (Findings of Fact ¶¶ 31, 359.) And when Apple decided to give IAP as an option instead of a requirement for certain membership subscriptions, the head of the App Store conceded that “[u]nfortunately, IAP being ‘optional’ means that no one will ever use it”. (PX-202.1.) This is strong evidence of two separate products. *See Kodak*, 504 U.S. at 462 (finding “[e]vidence in the record indicat[ing] that service and parts . . . still are sold separately” to cast doubt on the defendant’s claim of a “unified market” for services and parts).

390. Conversely, Apple provides payment solutions outside of the App Store using the same payment systems as IAP. The payment systems Apple uses for IAP “are also used for other products outside of the App Store”, including “the iTunes Store on iOS, Apple Music, and iCloud or Cloud services”. (Findings of Fact ¶ 365.) Therefore, IAP is clearly not an integrated part of the App Store—it is simply a payment system Apple uses with many of its services.

391. *Second*, many developers, from the largest to the smallest and across industries, including Epic, Microsoft, Match Group, Google, and Basecamp, have requested to use non-IAP payment solutions to handle in-app purchases of digital content on iOS. Apple has denied these requests. Apple has also rejected or removed thousands of apps for including non-IAP payment methods. (Findings of Fact ¶ 357.)

392. Developers have a number of reasons for seeking to use alternative payment solutions. While the level of Apple’s commission is one reason, others include the ability to offer specific services precluded by Apple’s IAP. For instance, customized risk management and fraud protection tools, more flexible pricing structures, access to relevant commerce and payments data, visibility into the developer’s payments stream, and the ability to provide direct and comprehensive customer service, all could be offered by alternative payment solutions. (Findings of Fact ¶ 358.) Among other evidence (Findings of Fact§ VI.B), the Court heard directly from a number of these developers at trial about their reasons for desiring alternative payment solutions. (Findings of Fact §§ VIII.A-G.)

393. *Third*, there is significant consumer demand for alternative payment solutions on iOS. When Epic offered Epic direct payment alongside IAP in *Fortnite* on iOS, more consumers used Epic direct payment than IAP. (Findings of Fact ¶¶ 357, 361.)

394. Undoubtedly, one reason that consumers used Epic direct payment rather than IAP was that Epic competed on price. Courts encourage such price competition. *See, e.g.*, *Pac. Bell Tel. Co. v. linkLine Commc'ns, Inc.*, 555 U.S. 438, 451 (2009) (noting that winning business by offering low but not predatory prices “often is the very essence of competition” (citations and internal quotation marks omitted)).

395. But there are also non-price reasons why consumers prefer alternatives to IAP, including access to a wider range of payment options as well as the cross-platform ability to obtain purchase history, pay using the same credentials, enable family sharing, and set persistent parental control settings. (Findings of Fact ¶ 360.)

396. For example, when Tinder offered its Android users an option to pay using Tinder’s payment solution or Google Play’s payment solution—each at the *same* price—[REDACTED]

[REDACTED]
[REDACTED] (PX-863; Ex. Depo. 1 at 43:4-44:19, 45:1-46:10, 46:13-15, 46:17-47:7 (Ong); Evans Trial Tr. 1601:17-21; 1602:2-13.)

397. *Fourth*, on other platforms besides iOS, many app stores without market power do not tie distribution services and payment solutions. For example, EGS and several Android app stores all allow developers to choose their own payment solutions. (Findings of Fact ¶¶ 371, 375, 474, 488.) When given the choice, many developers use alternatives. The

evidence at trial shows several developers that distribute their games through EGS have elected to use their own solutions for in-app transactions. (Findings of Fact ¶ 488.)

398. *Fifth*, the in-app payment processing industry has grown substantially over the last two decades. A number of third-party payment processors, such as Chase Paymentech, Adyen, Worldpay, PayPal, Inc., Checkout.com, and Stripe, compete with each other along a number of dimensions, including their ability to accommodate varying consumer payment preferences, service multiple geographies, improve user interfaces, and deliver insights from data on payment processing to provide business insights. (Findings of Fact ¶¶ 538-545.) The vibrant competition among payment processors outside of iOS is strong evidence of separate demand. *See Kodak*, 504 U.S. at 462 (reasoning that “the development of the entire high-technology service industry is evidence of the efficiency of a separate market for service”).

399. Citing *Amex*, Apple argues that the App Store and IAP are not separate products because IAP is an “input[] into transactions” provided by the App Store. (Ex. Expert 8 (Schmalensee) ¶ 34.) This argument is unpersuasive. While *Amex* instructs that two-sided transaction platforms like the App Store “facilitate a single, simultaneous transaction between participants”, the Court made this observation in the context of explaining why it was necessary to “[e]valuat[e] both sides of a two-sided transaction platform . . . to accurately assess competition” (with “both sides” referring to cardholders and merchants in that case). *Am. Express*, 138 S. Ct. at 2286-87. Here, the two sides of the App Store are consumers and developers, and the Court has considered both sides in defining the relevant markets, assessing market power, and considering market effects—and has therefore followed this instruction from *Amex*. Apple reads *Amex* to say that not only must the two sides of the platform be considered,

but also that products and services that are *downstream* from a two-sided transaction platform (like payment solutions for subsequent in-app purchases) must also be considered part of that platform. But *Amex* says no such thing. For example, *Amex* says nothing about the market in which providers of credit card *terminals* compete, even though such terminals are clearly an “input” without which credit card transactions would not be possible. *Amex* does not address the question of separate demand for tying purposes. That question is not resolved merely by calling a market two-sided; it instead depends on the “purchaser demand” test from *Jefferson Parish* described above.

400. Apple has argued that even when separate demand exists for tied products, courts “should” also require “proof of [a] seller[‘s] ability to unbundle” those products. (Legal Framework (ECF No. 276) at 41 (internal quotation marks omitted).) Apple has not identified any court that has adopted such a rule. In *Jefferson Parish*, 466 U.S. at 21, the Supreme Court established the “purchaser demand” test. Under that test, a plaintiff need not prove that a defendant can unbundle the tied and tying products in order to carry its burden of showing that the two products are separate and distinct. Applied here, Epic has carried its burden and more. The evidence demonstrates not only separable demand for the App Store and IAP, but also that there is no real technical reason why they need be integrated at all. Apple’s tie is not technological, it is contractual.

401. The Court concludes that app distribution and payment processing are separate products.

ii. Apple ties app distribution and in-app payment solutions.

402. A tie exists where “sale of the desired (‘tying’) product is conditioned on purchase of another (‘tied’) product”. *Aerotec*, 836 F.3d at 1178 (citation omitted). “[T]he essential characteristic of an invalid tying arrangement lies in the seller’s exploitation of its control over the tying product to force the buyer into the purchase of a tied product that the buyer either did not want at all, or might have preferred to purchase elsewhere on different terms.”

Jefferson Parish, 466 U.S. at 12.

403. As explained above, Apple does not dispute that it conditions app distribution on the exclusive use of Apple’s IAP for purchases of digital content under § 3.3.3 of the DPLA and Guideline 3.1.1. (See § IV above.)

404. Apple argues, however, that even if payment solutions and app distribution are separate products, they have not been tied because offering in-app purchases of digital content or charging for an app are only two of the many options offered to developers to monetize their apps in the App Store. (Ex. Expert 8 (Schmalensee) ¶ 132.) This argument misses the point. The purpose of the tying doctrine is to prevent a defendant from foreclosing competition for the tied product. If some developers choose not to offer in-app purchases because of Apple’s IAP requirement, that proves only that Apple’s IAP requirement restricts output in the iOS In-App Payment Solutions Market. It does not vindicate Apple’s tie. Independently, the factual premise of Apple’s argument is incorrect, as many apps cannot—as a practical matter—take advantage of other ways to monetize. (Evans Trial Tr. 1603:19-1604:6.) For example, in-game advertising would create a poor experience for users and is not a viable substitute for selling digital content in *Fortnite*. (Findings of Fact ¶ 445.)

405. The Court concludes that Apple ties app distribution and payment processing.

B. Apple coerces developers into using IAP.

406. Next, the Court assesses whether Apple has sufficient market power in the tying product market—that is, the iOS App Distribution Market. “[T]he Supreme Court has condemned tying arrangements when the seller has the market power to force a purchaser to do something that he would not do in a competitive market.” *Cascade*, 515 F.3d at 915.

407. “[W]hat is required in a *per se* case is not power over the whole market for the tying product, but only . . . a ‘type of market power [that] has sometimes been referred to as leverage defined here as a supplier’s ability to induce his customers for one product to buy a second product from him that would not be purchased solely on the merit of that second product.’” *Digidyne Corp. v. Data Gen. Corp.*, 734 F.2d at 1341 (quoting *Jefferson Parish*, 466 U.S. at 14 n.20); *see also Cty. of Toulumne v. Sonora Cnty. Hosp.*, 236 F.3d 1148, 1157 (9th Cir. 2001) (requiring for a *per se* violation “such power in the tying product or service market that the existence of forcing is probable” (internal quotation marks omitted)).

408. Apple has a 100% monopoly in the iOS App Distribution Market, and employs this power to coerce developers into using IAP. (*See* § II.A above); *CollegeNet, Inc. v. Common Application, Inc.*, 355 F. Supp. 3d 926, 955 (D. Or. 2018) (“[F]orcing (or coercion) is likely if the seller has power in the tying product market” (quoting *Robert’s Waikiki U-Drive, Inc. v. Budget Rent-a-Car Sys., Inc.*, 732 F.2d 1403, 1407 (9th Cir. 1984))). In fact, developers are prohibited from using alternatives to IAP for purchases of digital content, and if developers resist the tie, they lose access to more than one billion iOS users.

409. The Court finds that Apple has sufficient market power to coerce developers into using IAP, and has so coerced them.

C. Apple's tie affects a not insubstantial volume of commerce.

410. The final element to proving a tie is determining whether the alleged tie affects a not insubstantial volume of commerce in the tied product market. Here, as set forth above, the iOS In-App Payment Solutions Market is the tied market, and Apple's practices have affected a not insubstantial volume of commerce.

411. A substantial volume of commerce with respect to the tied product is foreclosed where "a total amount of business, substantial enough in terms of dollar-volume so as not to be merely *de minimis*, is foreclosed by competitors to the tie". *Fortner Enters., Inc. v. U.S. Steel Corp.*, 394 U.S. 495, 501 (1969); *see also Datagate*, 60 F.3d at 1425 (foreclosure of a single purchaser sufficient so long as the dollar volume of sales is "not insubstantial").

412. Apple's tie easily affects the requisite level of commerce in the iOS In-App Payment Solutions Market. In fiscal year 2019 alone, Apple's commission on in-app purchases accounted for over [REDACTED] of App Store revenue, or about [REDACTED]. (Findings of Fact ¶ 380.) Apple forecloses Epic and all other potential providers of payment solutions from competing for this revenue and from offering their services on more than one billion iOS devices. (*See also* § IV.B.iii above.)

413. The Court concludes that Epic has proved the elements of *per se* tying.

D. Apple has no legitimate business justification for tying app distribution and in-app payment processing.

414. Apple has sought to excuse its conduct on the basis that “at all times its conduct was reasonable and that its actions were undertaken in good faith to advance legitimate business interests and had the effect of promoting, encouraging, and increasing competition”. (Apple’s Answer (ECF No. 66) at p. 36 (Affirmative Defense 2).) The Court finds this defense unavailing.

415. While the Ninth Circuit has “recognized that antitrust defendants may demonstrate a business justification for an otherwise per se illegal tying arrangement”, “[t]he defendant bears the burden of showing that the case falls within the contours of this affirmative defense”. *Mozart Co. v. Mercedes-Benz of N. Am., Inc.*, 833 F.2d 1342, 1348-49 (9th Cir. 1987).

416. For the same reasons that Apple is unable to show any procompetitive justifications for its unlawful monopoly maintenance under the rule of reason framework (*see* § IV.B above), its legitimate business justifications defense fails here as well.

417. The Court concludes that Apple is liable for *per se* tying under Section 1.

E. In the alternative, Apple’s tie violates the rule of reason.

418. Even if the Court had determined that Epic had not proven the elements of *per se* tying or that the *per se* standard did not apply, Apple would still be liable for a Section 1 tying violation.

419. Apple has argued that “[t]o prevail under the rule of reason, a plaintiff initially must prove the first three requirements of a per se tying claim”. (Legal Framework (ECF No. 276) at 49.) This is incorrect. The *per se* elements “are necessary only to bring into

play the doctrine of *per se* illegality". *Fortner Enters.*, 394 U.S. at 499-500. If a plaintiff fails to establish *per se* liability, a plaintiff "can still prevail on the merits", *id.* at 500, by demonstrating that a defendant "violated the Sherman Act because it unreasonably restrained competition" under the rule of reason, *Jefferson Parish*, 466 U.S. at 29; *Microsoft Corp.*, 253 F.3d at 95-97; *Epic Games*, 2020 WL 5993222, at *16 n.28 (citing *Microsoft* and noting that "Epic Games may be able to prove anticompetitive effects even if it cannot show separate products").

420. Under the rule of reason, Epic "can prove, on the basis of a more thorough examination of the purposes and effects of the practices involved, that the general standards of the Sherman Act have been violated". *Fortner Enters.*, 394 U.S. at 500.

421. For rule of reason tying, Epic must show "an actual adverse effect on competition caused by the tying arrangement". *Brantley v. NBC Universal, Inc.*, 675 F.3d 1192, 1200 (9th Cir. 2012) (citation and internal quotation marks omitted). Courts conduct this analysis using the familiar three-part burden-shifting framework. *See id.* at 1197-1200; (§ V above).

422. Application of the burden-shifting analysis for Epic's tying claim is the same as for its more general Section 1 claim relating to the iOS In-App Payment Solutions Market. For the reasons stated above (*see* § VI above), Epic has proven its claim under that framework.¹⁷

¹⁷ To the extent that Apple asserts as affirmative defenses to Count 6 the same affirmative defenses addressed above in the context of Count 1 (monopoly maintenance in the iOS App Distribution Market), the Court denies those affirmative defenses with respect to Count 6 (tie of app distribution and payment processing) for the same reasons. (*See* § I.D above.)

VIII. CALIFORNIA'S CARTWRIGHT ACT: APPLE'S UNREASONABLE RESTRAINT OF TRADE IN THE IOS APP DISTRIBUTION MARKET (COUNT 7).

423. Epic brings suit not only under the federal antitrust laws, but also under the California antitrust and unfair competition laws. Although these laws largely track federal law, they are broader in important ways.

424. The Cartwright Act makes “unlawful, against public policy and void” “every trust”, defined as “a combination of capital, skill, or acts by two or more persons . . . [t]o create or carry out restrictions in trade or commerce”. Cal. Bus. & Prof. Code §§ 16720, 16726.

425. “Interpretations of federal antitrust law are at most instructive, not conclusive, when construing the Cartwright Act, given that the Cartwright Act was modeled not on federal antitrust statutes but instead on statutes enacted by California’s sister states around the turn of the 20th century.” *Aryeh v. Canon Bus. Sols., Inc.*, 55 Cal. 4th 1185, 1195 (2013) (citation omitted). “The Ninth Circuit has recognized after *Aryeh* it ‘is no longer the law in California’ that the Cartwright Act is ‘coextensive with the Sherman Act.’” *In re Lithium Ion Batteries Antitrust Litig.*, No. 13-MD-2420, 2014 WL 4955377, at *10 (N.D. Cal. Oct. 2, 2014) (quoting *Samsung Elecs. Co. v. Panasonic Corp.*, 747 F.3d 1199, 1205 n.4 (9th Cir. 2014)).

426. As recognized by the California Supreme Court, “[t]he Cartwright Act is broader in range and deeper in reach than the Sherman Act”. *In re Cipro Cases I & II*, 61 Cal. 4th 116, 160-161 (2015) (quoting *Cianci v. Super. Ct.*, 40 Cal. 3d 903, 920 (1985)). It “reaches beyond the Sherman Act to threats to competition in their incipency—much like section 7 of the Clayton Act, which prohibits mergers that ‘may . . . substantially . . . lessen competition, or . . . tend to create a monopoly—and thereby goes beyond clear-cut menaces to competition in order

to deal with merely ephemeral possibilities.” *Cianci*, 40 Cal. 3d at 918 (citations and internal quotation marks omitted).

427. Epic’s claim that Apple unreasonably restrains trade in the iOS App Distribution Market in violation of the Cartwright Act (Count 7) includes the same conduct as Epic’s claim that Apple unreasonably restrains trade in the iOS App Distribution Market in violation of Section 1 of the Sherman Act (Count 3). Accordingly, because Epic has prevailed on Count 3 (*see* § V above), the Court also finds in Epic’s favor on Count 7.

428. Finally, to the extent that Apple alleges the affirmative defenses addressed above in the context of Count 1 (monopoly maintenance in the iOS App Distribution Market), the Court should deny those affirmative defenses with respect to Count 6 (unreasonable restraint of trade in the iOS App Distribution Market) for the same reasons (*see* § II.D above), except as to two of the affirmative defenses, which are rejected for different reasons discussed below.

429. *First*, with respect to Apple’s FTAIA affirmative defense, the FTAIA applies to only “Sections 1 to 7 of this title”—that is, the Sherman Act. 11 U.S.C. § 6a. Therefore, it does not limit the scope of California statutes, such as the Cartwright Act (or UCL, which is discussed below).

430. *Second*, with respect to Apple’s statute of limitations defense, a statute of limitations does not apply to Epic’s federal claims, but a statute of limitations does apply to Epic’s California claims. “The statute of limitations under the Cartwright Act and UCL is four years.” *Bartlett v. BP W. Coast Prods. LLC*, No. 18-CV-01374, 2019 WL 2177655, at *2 (S.D. Cal. May 17, 2019) (citing Cal. Bus. & Prof. Code §§ 16750.1, 17208); *see also Garrison v. Oracle Corp.*, 159 F. Supp. 3d 1044, 1062 (N.D. Cal. 2016) (same). Because Epic brought suit

within four years of suffering injury (*see* § II.D.v.b above), Epic’s claims are timely under the these statutes of limitations.

431. Accordingly, the Court finds that Apple has violated the Cartwright Act in the iOS App Distribution Market.

IX. CALIFORNIA’S CARTWRIGHT ACT: APPLE’S UNREASONABLE RESTRAINT OF TRADE IN THE IOS IN-APP PAYMENT SOLUTIONS MARKET (COUNT 8).

432. Epic also alleges that Apple violated the Cartwright Act by unreasonably restraining trade in the iOS In-App Payment Solutions Market. This claim is based on the same conduct as Epic’s claim that Apple unreasonably restrained trade in the iOS In-App Payment Solutions Market in violation of Section 1 of the Sherman Act (Count 5). Accordingly, because Epic has prevailed on Count 5 (*see* § VI above), it also prevails on Count 8.¹⁸

X. CALIFORNIA’S CARTWRIGHT ACT: APPLE’S TIE OF APP DISTRIBUTION AND PAYMENT PROCESSING (COUNT 9).

433. As explained above, Apple has tied app distribution and payment processing in violation of Section 1 of the Sherman Act. (*See* § VII above.) This conduct also violates the Cartwright Act.

434. To establish a *per se* tying claim under § 16720 of the Cartwright Act, the plaintiff must show “(1) a tying agreement, arrangement or condition [] whereby the sale of the tying product [or service] was linked to the sale of the tied product or service; (2) the party had

¹⁸ To the extent that Apple asserts as affirmative defenses to Count 8 the same affirmative addressed above in the context of Count 1 (monopoly maintenance in the iOS App Distribution Market) and/or Count 7 (unreasonable restraint of trade in the iOS App Distribution Market), the Court denies those affirmative defenses with respect to Count 8 (unreasonable restraint of trade in the iOS In-App Payment Solutions Market) for the same reasons. (*See* §§ II.D, VIII above.)

sufficient economic power in the tying market to coerce the purchase of the tied product; (3) a substantial amount of sale was effected in the tied product; and (4) the complaining party sustained pecuniary loss as a consequence of the unlawful act". *UAS Mgmt., Inc. v. Mater Misericordiae Hosp.*, 169 Cal. App. 4th 357, 369 (2008) (alternation adding "or service" in original) (quoting *Classen v. Weller*, 145 Cal. App. 3d 27, 37-38 (Ct. App. 1983)). In addition, a tie, even if not *per se* illegal, may still be an "unreasonable restraint[] of trade" under the Cartwright Act. *Kim v. Servosnax, Inc.*, 10 Cal. App. 4th 1346, 1361 (1992).

435. Epic's claim that Apple unlawfully ties app distribution to in-app payment solutions in the iOS In-App Payment Solutions Market in violation of the Cartwright Act is based on the same conduct as Epic's claim that Apple unlawfully ties app distribution to in-app payment solutions in the iOS In-App Payment Solutions Market in violation of Section 1 of the Sherman Act (Count 6). If Apple's conduct violates Section 1 of the Sherman Act, it also necessarily violates the Cartwright Act. Accordingly, because Epic has prevailed on Count 6 (see § VII above), it also prevails on Count 9.

436. By tying app distribution and in-app payment solutions in the iOS In-App Payment Solutions Market, Apple has violated the Cartwright Act.¹⁹

¹⁹ To the extent that Apple asserts as affirmative defenses to Count 9 the same affirmative defenses addressed above in the context of Count 1 (monopoly maintenance in the iOS App Distribution Market), Count 6 (tie of app distribution and payment processing), and/or Count 7 (unreasonable restraint of trade in the iOS App Distribution Market), the Court denies those affirmative defenses with respect to Count 9 (tie of app distribution and payment processing) for the same reasons. (See §§ II.D, VII.D, VIII above.)

XI. CALIFORNIA'S UNFAIR COMPETITION LAW: APPLE'S UNFAIR COMPETITION IN THE IOS APP DISTRIBUTION MARKET AND IOS IN-APP PAYMENT SOLUTIONS MARKET (COUNT 10).

437. Epic alleges that Apple has violated one other California statute.

California's Unfair Competition Law ("UCL") prohibits business practices that constitute "unfair competition", which is defined, in relevant part, as "any unlawful, unfair or fraudulent business act or practice". Cal. Bus. & Prof. Code § 17200. Claims under the UCL are available to both business competitor and consumer plaintiffs. *Cel-Tech Commc'ns, Inc. v. L.A. Cellular Tel. Co.*, 20 Cal. 4th 163, 186-87 & n.12 (1999).

438. Epic brings its UCL claim both as an app distributor that competes with Apple and as a consumer of Apple's app distribution and IAP services.

439. As explained below, Apple's conduct in the iOS App Distribution Market and iOS In-App Payment Solutions Market is unlawful and/or unfair. (*See* § XI.A.) Further, Epic has statutory standing both as a competitor and consumer to bring its UCL claim. (*See* § XI.B.)

440. For the reasons explained below, the Court finds that Apple has violated the UCL.

A. Apple's conduct in the iOS App Distribution Market and iOS In-App Payment Solutions Market is unlawful and/or unfair.

441. Apple's conduct is both unlawful (*see* § XI.A.i) and unfair (*see* § XI.A.ii) under the UCL.

i. Apple's conduct is unlawful under the UCL.

442. The UCL “permits violations of other laws to be treated as unfair competition that is independently actionable”. *AngioScore, Inc. v. TriReme Med., LLC*, 70 F. Supp. 3d 951, 961 (N.D. Cal. 2014) (citation omitted). The law covers any conduct that “can properly be called a business practice and that at the same time is forbidden by law”. *Korea Supply Co. v. Lockheed Martin Corp.*, 29 Cal. 4th 1134, 1143 (2003) (citation omitted). “Virtually any law—federal, state or local—can serve as a predicate for an action under Business and Professions Code section 17200.” *Durell v. Sharp Healthcare*, 183 Cal. App. 4th 1350, 1361 (2010) (citation omitted).

443. Thus, in order to be found to be “unlawful” for purposes of Epic’s UCL claim, the Court must find that Apple also has violated the Sherman Act or Cartwright Act. *See, e.g., Aleksick v. 7-Eleven, Inc.*, 205 Cal. 4th 1176, 1185 (Ct. App. 2012); *Cascades Comput. Innovation LLC v. RPX Corp.*, No. 12-CV-01143-YGR, 2013 WL 316023, at *15 (N.D. Cal. Jan. 24, 2013); *Datel Holdings Ltd. v. Microsoft Corp.*, 712 F. Supp. 2d 974, 999 (N.D. Cal. 2010).

444. As discussed above, Epic has established that Apple’s conduct in the iOS App Distribution Market and iOS In-App Payment Solutions Market violates the Sherman Act and Cartwright Act. (*See §§ II-VII above.*) Accordingly, Apple’s conduct is also unlawful under the UCL.

ii. Apple's conduct is unfair under the UCL.

445. Conduct that violates the antitrust laws is also unfair under the UCL. *See Cel-Tech*, 20 Cal. 4th at 187 (for business competitor claim, *Cel-Tech* test is satisfied by a violation of the antitrust law); *Drum v. San Fernando Valley Bar Ass’n*, 182 Cal. App. 4th 247,

256 (2010) (for consumer claim under tethering test, analysis mirrors *Cel-Tech* test); *id.* (for consumer claim under balancing test, conduct is unlawful if it is “substantially injurious to consumers” and the conduct’s harm outweighs its utility).

446. While a violation of antitrust law may be sufficient, it is not necessary; conduct may be actionable as unfair under the UCL even if it does not violate an antitrust law. *Cel-Tech*, 20 Cal. 4th at 180 (“[A] practice may be deemed unfair even if not specifically proscribed by some other law.”); *Chavez v. Whirlpool Co.*, 93 Cal. App. 4th 363, 375 (2001) (California courts “do not hold that in all circumstances an ‘unfair’ business act or practice must violate an antitrust law to be actionable under the unfair competition law”); *Korea Kumho Petrochemical v. Flexsys Am. LP*, No. C07-01057, 2008 WL 686834, at *9 (N.D. Cal. Mar. 11, 2008) (dismissing Sherman Act and Cartwright Act claims, but declining to dismiss UCL claim, finding that although plaintiff had not pled an antitrust violation, defendant’s alleged threats against plaintiff’s customers and attempts to organize boycotts directed at its customers constituted an “unfair” practice).

447. As a competitor and a consumer with respect to Apple (*see* § XI.B below), Epic has shown that Apple’s conduct is unfair for purposes of the UCL.

448. When the plaintiff is a business competitor, it must show that the alleged conduct “threatens an incipient violation of an antitrust law, or violates the policy or spirit of one of those laws because its effects are comparable to or the same as a violation of the law, or otherwise significantly threatens or harms competition”. *Cel-Tech*, 20 Cal. 4th at 187. The business competitor plaintiff must show that “any finding of unfairness to competitors under [the UCL] [is] tethered to some legislatively declared policy or proof of some actual or threatened

impact on competition”. *Id.* at 186-87; *see also People’s Choice Wireless, Inc. v. Verizon Wireless*, 131 Cal. App. 4th 656, 662 (2005) (conduct violates the policy or spirit of antitrust laws if the “effect of the conduct is comparable to or the same as a violation of the antitrust laws”).

449. Here, as discussed in detail above, Epic has sufficiently demonstrated that Apple’s conduct in the iOS App Distribution Market and iOS In-App Payment Solutions Market “threatens or harms competition” and is thus unfair for purposes of a UCL claim brought by a business competitor. *Cel-Tech*, 20 Cal. 4th at 187; (*see §§ II-X above*).

450. When UCL claims are brought by consumers of the defendant’s products or services, California law is unsettled with regard to the correct standard to apply. *Lozano v. AT & T Wireless Servs., Inc.*, 504 F.3d 718, 735-36 (9th Cir. 2007). California courts have applied three tests to evaluate claims by consumers of unfairness the UCL: (1) the “tethering test”, (2) the “balancing test”, and (3) the FTC test. *Drum v. San Fernando Valley Bar Ass’n*, 182 Cal. App. 4th 247, 257 (2010); *In re Adobe Sys., Inc. Privacy Litig.*, 66 F. Supp. 3d 1197, 1226 (N.D. Cal. 2014); *Camacho v. Auto. Club of S. Cal.*, 142 Cal. App. 4th 1394, 1403 (2006). However, the Ninth Circuit has “decline[d] to apply the FTC standard in the absence of a clear holding from the California Supreme Court”. *Lozano*, 504 F.3d at 736. Therefore, “[t]he remaining options . . . are to apply *Cel-Tech* to this case and require that the unfairness be tied to a legislatively declared policy or to adhere to the former balancing test”. *Id.* (internal quotation marks and citation omitted); *In re Adobe*, 66 F. Supp. 3d at 1226 (for consumer claims under the unfairness prong of the UCL, “there are at least two possible tests: (1) the ‘tethering test’, . . . and (2) the ‘balancing test’”).

451. The “tethering test” mirrors the *Cel-Tech* test that is applied in the context of business competitor claims, as discussed above. *Adobe*, 66 F. Supp. 3d at 1226-27 (citing *Cel-Tech* while analyzing the consumer plaintiff’s UCL claim under the “tethering test”). Epic has sufficiently demonstrated that Apple’s conduct in the iOS App Distribution Market and iOS In-App Payment Solutions Market “threatens or harms competition” in the iOS App Distribution Market and thus violates the UCL under the tethering test. (See §§ II-X above.)

452. The “balancing test” requires a consumer plaintiff to show that (1) a defendant’s conduct “is immoral, unethical, oppressive, unscrupulous or substantially injurious to consumers” and (2) “the utility of the defendant’s conduct” is outweighed by “the gravity of the harm to the alleged victim”. *Drum*, 182 Cal. App. 4th at 257 (citation and internal quotation marks omitted).

453. Apple has argued that “a balancing test is inappropriate for consumer claims”. (Legal Framework (ECF No. 276) at 97.) This is incorrect. The balancing test remains good law after *Cel-Tech* for claims brought by consumers because “the [*Cel-Tech*] court expressly limited its new test to actions by competitors”. *Davis v. HSBC Bank Nev., N.A.*, 691 F.3d 1152, 1170 (9th Cir. 2012); see *Cel-Tech*, 20 Cal. 4th at 187 n.12.

454. Epic has demonstrated that the balancing test is satisfied with respect to Apple’s conduct in the iOS App Distribution Market and iOS In-App Payment Solutions Market. Apple’s anti-competitive conduct with respect to iOS app distribution harms consumers, who are denied choice and innovation in app distribution channels and are forced to pay higher prices and suffer inferior customer service from Apple, the unwelcome middleman. Similarly, Apple’s anti-competitive conduct with respect to payment processing harms consumers, who are denied

choice and innovation in payment processing solutions and are forced to pay higher prices and lose control of their relationships with their users. (*See §§ II.B, IV.B above.*)

B. Epic has statutory standing to bring its UCL claim.

455. To file suit under the UCL, a plaintiff must demonstrate it has standing . The UCL permits claims to be brought by any “person”, which includes “natural persons, corporations, firms, partnerships, joint stock companies, associations and other organizations of persons”. Cal. Bus. & Prof. Code §§ 17201, 17204. To bring a claim under the UCL, a plaintiff must “(1) establish a loss or deprivation of money or property sufficient to quantify as injury in fact, i.e., economic injury, and (2) show that the economic injury was the result of, i.e., *caused by*, the unfair business practice”. *Kwikset Corp. v. Super. Ct.*, 51 Cal. 4th 310, 322 (2011); *see also* Cal. Bus. & Prof. Code § 17204.

456. The injury-in-fact requirement “incorporate[s] the established federal meaning” for federal standing under Article III. *Kwikset Corp.*, 51 Cal. 4th at 322. Accordingly, an injury in fact must be “concrete and particularized . . . and actual or imminent, not conjectural or hypothetical”. *Lujan v. Defenders of Wildlife*, 504 U.S. 555, 560 (1992) (citations and internal quotation marks omitted); *see also Juliana v. United States*, 947 F.3d 1159, 1168 (9th Cir. 2020).

457. The UCL requires the plaintiff to “demonstrate some form of economic injury”. *Kwikset Corp.*, 51 Cal. 4th at 323. For example, “[a] plaintiff may (1) surrender in a transaction more, or acquire in a transaction less, than he or she otherwise would have; (2) have a present or future property interest diminished; (3) be deprived of money or property to which he or she has a cognizable claim; or (4) be required to enter into a transaction, costing money or property, that would otherwise have been unnecessary”. *Id.* (citation omitted). If the plaintiff

proves “a personal, individualized loss of money or property in any nontrivial amount, he or she has also . . . proven injury in fact”. *Id.* at 325.

458. To satisfy the causation requirement, a plaintiff must show “a causal connection” between the defendant’s conduct and alleged injury. *Id.* at 326. This “imposes a requirement that a violation must cause or result in some sort of damage”. *Id.* (citations, internal quotation marks, and alterations omitted).

459. Epic meets each of these requirements and has statutory standing. Epic has standing under the UCL both as a potential competitor of Apple in the iOS App Distribution Market and iOS In-App Payment Solutions Market (*see* § XI.B.i below), and as a customer of Apple in the iOS App Distribution Market and iOS In-App Payment Solutions Market (*see* XI.B.ii below).

i. Epic has standing as a potential competitor of Apple.

460. **Injury in fact.** With respect to the iOS App Distribution Market, Epic has been injured as a would-be competing app distributor. Epic already distributes apps on PCs and Macs through EGS. If EGS were permitted on iOS, Epic would compete directly with Apple in the iOS App Distribution Market. (Findings of Fact ¶¶ 429, 432.)

461. With respect to the iOS In-App Payment Solutions Market, Epic has been injured as a would-be competing payment solution provider. Epic offers payment solutions through Epic direct payment to apps distributed by EGS on PCs and Macs. If EGS were permitted on iOS and Apple did not require use of IAP, Epic would offer Epic direct payment to apps distributed by EGS on iOS. (Findings of Fact ¶ 362.)

462. **Lost money or property.** With respect to the iOS App Distribution Market, if EGS were permitted on iOS, Epic would earn revenue from the distribution of third-party games as well as grow the EGS userbase to make it a more desirable storefront for consumers and developers alike—but for Apple’s complete foreclosure of alternative means of app distribution on iOS. (Findings of Fact ¶¶ 307, 313.)

463. With respect to the iOS In-App Payment Solutions Market, Epic would earn revenue from developers using its payment solution on apps distributed by EGS—but for Apple’s IAP requirement. (Findings of Fact ¶ 362.)

464. **Causation.** With respect to the iOS App Distribution Market, Apple’s conduct expressly prohibits Epic from distributing apps for iOS and has thus caused the injuries described above. (Findings of Fact ¶¶ 307, 308, 313, 432, 476, 477, 479.)

465. With respect to the iOS In-App Payment Solutions Market, Apple’s conduct expressly prohibits Epic from handling in-app payments for digital content on iOS and has thus caused the injuries described above. (Findings of Fact ¶ 362.)

ii. Epic has standing as a customer of Apple in the iOS App Distribution Market and iOS In-App Payment Solutions Market.

466. Apple has disputed that Epic can bring a claim under the consumer standard. (Legal Framework (ECF No. 276) at 88.) However, a “consumer” under the UCL may include a business consumer or client. *See Copart, Inc. v. Sparta Consulting, Inc.*, 339 F. Supp. 3d 959, 992 (E.D. Cal. 2018) (in an action by Copart, a global used car auction company, against Sparta, which was hired to design and build a new business management system for Copart, the court evaluated Copart’s UCL claim against Sparta in the consumer context, finding that “Copart

was Sparta’s consumer or client, not a competitor”). As an app developer, Epic is a business consumer of Apple. Apple distributes Epic’s apps and handles in-app purchases on Epic’s behalf.

467. **Injury in fact.** Epic has been injured as a customer of Apple. With respect to the iOS App Distribution Market, Epic been foreclosed from using methods of app distribution other than Apple’s App Store on iOS. Up until August 13, 2020, Epic distributed *Fortnite* and certain other apps to iOS users through Apple’s App Store. Epic still distributes other apps, such as *Houseparty*, through the App Store. Absent Apple’s rules, Epic would not distribute its apps through the App Store. Instead, Epic would directly distribute its apps to users like it currently does on PC, Mac, and Android, and/or distribute them through EGS on iOS. (Findings of Fact ¶¶ 307, 477.)

468. With respect to the iOS In-App Payment Solutions Market, Epic has been foreclosed from using non-IAP payment methods. Epic self-supplies Epic direct payment to its own apps on PC, Mac, and Android. If Apple did not require use of IAP, Epic would not use IAP exclusively. Epic would self-supply Epic direct payment. (Findings of Fact ¶ 362.)

469. **Lost money or property.** With respect to both the iOS App Distribution Market and In-App Payment Solutions Market, Epic has paid supra-competitive commissions for in-app payment processing solutions that it would not have paid in the absence of Apple requiring that developers use the App Store and IAP. (Findings of Fact § VIII.A.)

470. **Causation.** With respect to both the iOS App Distribution Market and In-App Payment Solutions Market, Apple’s conduct expressly prohibits Epic from distributing apps

for iOS or from using non-IAP payment methods and has thus caused the injuries described above. (Findings of Fact, §§ IV.A, V.I.D., IX)

471. For the foregoing reasons, the Court finds that Apple has violated the UCL.²⁰

XII. EPIC IS ENTITLED TO A PERMANENT INJUNCTION IN THE IOS APP DISTRIBUTION MARKET AND IOS IN-APP PAYMENT SOLUTIONS MARKET.

472. To remedy Apple's misconduct, Epic seeks a permanent injunction in a form described in Appendix A of the parties' joint Legal Framework (ECF No. 276-1). The Court attaches that document as Appendix 1 hereto.

473. Epic's requested injunction would not require substantial changes to the iOS platform: Apple could continue bundling the App Store with iOS devices; it could continue scanning apps for, and taking other steps to prevent distribution of, malware; it could continue moderating the content that appears on the App Store in whatever manner it chooses; and it could continue offering IAP as a payment solution. (Sweeney Trial Tr. 93:8-19 ("Q. Is there any portion of the remedy that Epic is seeking that is asking for app review to go away? A. No. With respect to apps distributed through the iOS App Store, I'm a supporter of Apple's freedom to review apps. Q. And is there any portion of the remedy that Epic is seeking to have Apple's

²⁰ To the extent that Apple asserts as affirmative defenses to Count 10 the same affirmative defenses addressed above in the context of Count 1 (monopoly maintenance in the iOS App Distribution Market), Count 6 (tie of app distribution and payment processing), and/or Count 7 (unreasonable restraint of trade in the iOS App Distribution Market), the Court denies those affirmative defenses with respect to Count 10 (unfair competition in the iOS App Distribution Market and iOS In-App Payment Solutions Market) for the same reasons. (See §§ II.D, VII.D, VIII above.)

In-App Purchase functionality go away? A. No. I support Apple’s right to offer a purchasing system to developers that they may use with consumers.”); *see also* Federighi Trial Tr. 3456:7-22 (agreeing that iOS users can continue to choose to use Apple’s App Store even if they had additional options to download apps from other sources); Schiller Trial Tr. 2994:9-15 (agreeing that App Review and IAP “could continue to exist”)). What Apple would be unable to do is preference its own App Store or payment solution by prohibiting or discriminating against competitors on iOS.

474. Apple presents the Court with a parade of horribles, suggesting on the one hand the demise of iOS as a secure platform and on the other the need by the Court to micromanage Apple’s every step going forward. Neither argument is persuasive. It will be up to Apple to adopt a model that maintains the security iOS users value while abiding by the requirement that it not discriminate against third party distribution and payment solutions. Apple is an innovative company that is up to this task; indeed, as noted above, Apple’s own security team seems to have laid out the contours of such a model back in 2007, and Apple has implemented what the evidence suggests is an acceptable model for macOS.²¹

475. Epic is entitled to this injunction under federal law (*see* § XII.A below) and California law (*see* § XII.B below).

²¹ In *Microsoft*, Microsoft claimed that allowing users and OEMs to modify the Windows desktop and remove Internet Explorer from Windows would harm the “stability” and “consistency” of Windows. The court rejected these business justifications as pretextual. *Microsoft*, 253 F.3d at 64-65. With the advantage of hindsight, the Court is unaware of any evidence or study suggesting the remedies imposed on Microsoft harmed the stability or consistency of Windows. Those remedies, however, did arguably contribute to the proliferation of other platforms, including mobile platforms such as iOS.

A. Epic is entitled to a permanent injunction for its federal claims.

476. Under Section 16 of the Clayton Act, “[a]ny person, firm, corporation, or association shall be entitled to sue for and have injunctive relief, in any court of the United States having jurisdiction over the parties, against threatened loss or damage by a violation of the antitrust laws . . . , when and under the same conditions and principles as injunctive relief against threatened conduct that will cause loss or damage is granted by courts of equity, under the rules governing such proceedings”. 15 U.S.C. § 26.

477. Section 16, “which was enacted by the Congress to make available equitable remedies previously denied private parties, invokes traditional principles of equity and authorizes injunctive relief upon the demonstration of ‘threatened’ injury. . . . Moreover, the purpose of giving private parties treble-damage and injunctive remedies was not merely to provide private relief, but was to serve as well the high purpose of enforcing the antitrust laws. Section 16 should be construed and applied with this purpose in mind, and with the knowledge that the remedy it affords, like other equitable remedies, is flexible and capable of nice ‘adjustment and reconciliation between the public interest and private needs as well as between competing private claims.’ Its availability should be ‘conditioned by the necessities of the public interest which Congress has sought to protect.’” *Zenith*, 395 U.S. at 130-31 (footnote and citations omitted).

478. Epic is entitled to a permanent injunction under Section 16 because Epic has antitrust standing to seek such relief (*see* § XII.A.i below); the traditional equitable factors for a permanent injunction are satisfied (*see* § XII.A.ii below); and the scope of Epic’s requested injunction is proper (*see* § XII.A.iii below).

i. Epic has antitrust standing to seek a permanent injunction.

479. The elements of antitrust standing are undisputed. (Legal Framework (ECF No. 276) at 132.)

480. “[A]ntitrust standing” is a threshold requirement that every plaintiff must satisfy to bring a private suit under the federal antitrust laws”. *Lorenzo v. Qualcomm Inc.*, 603 F. Supp. 2d 1291, 1300 (S.D. Cal. 2009). “To have standing [to seek injunctive relief] under § 16 [of the Clayton Act], a plaintiff must show (1) a threatened loss or injury cognizable in equity (2) proximately resulting from the alleged antitrust violation”. *City of Rohnert Park v. Harris*, 601 F.2d 1040, 1044 (9th Cir. 1979). As discussed previously, Epic has satisfied the standard for antitrust injury and shown that Apple proximately caused its injuries.

481. In the iOS App Distribution Market, Epic has been injured as a consumer of app distribution because it is unable to distribute its iOS apps through any distribution channel other than the App Store. (See § II.C above.) Epic also has been harmed as an app distributor because Apple has prohibited Epic from offering EGS on iOS. (See § II.C above.)

482. Similarly, in the iOS In-App Payment Solutions Market, Apple has harmed Epic as an app developer because Epic cannot enjoy a choice of payment processing solutions, is denied the benefits of innovation in in-app payment processing, and is forced to pay a supra-competitive rate for using Apple’s IAP. (See § IV.C above.) Apple has also harmed Epic as a provider of competing in-app payment solutions because Epic cannot make Epic direct payment available as an option for apps that would be distributed by EGS on iOS. (See § IV.C above.)

483. Therefore, Epic has antitrust standing for Epic’s claims in both markets to seek a permanent injunction.

ii. The traditional equitable factors for a permanent injunction are satisfied.

484. In general, “a plaintiff seeking a permanent injunction must satisfy a four-factor test before a court may grant such relief. A plaintiff must demonstrate: (1) that it has suffered an irreparable injury; (2) that remedies available at law, such as monetary damages, are inadequate to compensate for that injury; (3) that, considering the balance of hardships between the plaintiff and defendant, a remedy in equity is warranted; and (4) that the public interest would not be disserved by a permanent injunction”. *eBay Inc. v. MercExchange, L.L.C.*, 547 U.S. 388, 391 (2006). At least one court in the Ninth Circuit has held that the Sherman Act does not impose any additional requirements on plaintiffs before a court may grant a permanent injunction. *See O’Bannon v. Nat’l Collegiate Athletic Ass’n*, 7 F. Supp. 3d 955, 1007 (N.D. Cal. 2014), *aff’d in part, vacated in part on other grounds*, 802 F.3d 1049 (9th Cir. 2015). But if the equitable factors apply here, Epic has satisfied them.

485. *First*, Epic has suffered irreparable harm. Irreparable harm is harm “for which there is no adequate legal remedy”. *Ariz. Dream Act Coal. v. Brewer*, 757 F.3d 1053, 1068 (9th Cir. 2014). “A lessening of competition constitutes an irreparable injury under [Ninth Circuit] case law”. *Boardman v. Pac. Seafood Grp.*, 822 F.3d 1011, 1023, 1025 (9th Cir. 2016) (affirming preliminary injunction); *see also Optronic Techs., Inc. v. Ningbo Sunny Elec. Co.*, No. 5:16-CV-06370-EJD, 2020 WL 1812257, at *3, *5 (N.D. Cal. Apr. 9, 2020) (permanently enjoining defendant and finding irreparable injury where antitrust violations “caused structural

harm” to the relevant market and “created a reasonable likelihood of substantially lessening competition”), *appeal docketed*, No. 20-15837 (9th Cir.).

486. As noted above, Apple has foreclosed competition in the iOS App Distribution Market. (See § II.B above.) Apple’s negative impact on competition has injured Epic in its capacity as an app developer and as a competing distributor. (See § II.C above.) These harms are irreparable. *See Boardman*, 822 F.3d at 1023; *Optronic*, 2020 WL 1812257, at *3.

487. Further, as explained above, Apple’s conduct has foreclosed competition in the iOS In-App Payment Solutions Market. The lack of competition injures Epic as an app developer and as a competing provider of payment solutions. (See § IV.C above.) Such harm is irreparable. *See Ariz. Dream Act Coal.*, 757 F.3d at 1068.

488. A plaintiff can also prove irreparable harm by showing that “remedies available at law, such as monetary damages, are inadequate to compensate for the injury”, *Herb Reed Enters., LLC v. Fla. Entm’t Mgmt., Inc.*, 736 F.3d 1239, 1249-50 (9th Cir. 2013), or “where “[t]he nature of the plaintiff’s loss may make damages very difficult to calculate”, *Cornucopia Prods., LLC v. Dyson Inc.*, No. CV 12-00234-PHX-NVW, 2012 WL 3094955, at *9 (D. Ariz. July 27, 2012) (quoting *Roland Machinery Co. v. Dresser Indus., Inc.*, 749 F.2d 380, 386 (7th Cir. 1984)).

489. It is impossible to quantify the harm that Epic has suffered as a developer unable to use non-IAP payment solutions or to distribute apps to the roughly one billion iOS users except through the App Store. The evidence at trial demonstrated that Epic’s inability to process refunds has generated a constant stream of customer complaints, impairing Epic’s

goodwill. *See Stuhlbarg Int'l Sales Co. v. John D. Brush & Co.*, 240 F.3d 832, 841 (9th Cir. 2001) (“loss of prospective customers or goodwill certainly supports a finding of . . . irreparable harm”). As Apple recognizes, “[d]amage to a business’[s] goodwill is typically an irreparable injury because it is difficult to calculate.” (Apple’s 5/21/21 COL ¶ 668 (quoting *Optinrealbig.com, LLC v. Ironport Sys., Inc.*, 323 F. Supp. 2d 1037, 1050 (N.D. Cal. 2004)).) Similarly, how successful EGS or Epic direct payment could be on iOS but for Apple’s foreclosure of competition is unknown. *See Cornucopia*, 2012 WL 3094955, at *9 (finding irreparable harm where “it is difficult to predict Dyson’s damages”). Monetary damages cannot be calculated for the additional reason that, because Apple’s unlawful conduct continues, the harm to Epic is ongoing. *See MGM Studios, Inc. v. Grokster, Ltd.*, 518 F. Supp. 2d 1197, 1219 (C.D. Cal. 2007) (finding irreparable injury where the defendant’s conduct “has and will continue to irreparably harm Plaintiffs’ [legal interests]” and “Plaintiffs cannot possibly recover all damages . . . as a consequence of the [defendant’s conduct]”).

490. *Second*, damages would be inadequate. “‘The necessary prerequisite’ for a court to award equitable remedies is ‘the absence of an adequate remedy at law.’” *Barranco v. 3D Sys. Corp.*, 952 F.3d 1122, 1129 (9th Cir. 2020) (quoting *Dairy Queen, Inc. v. Wood*, 369 U.S. 469, 478 (1962)). Whether remedies available at law are inadequate to compensate for the injury “inevitably overlaps” with the first prong of the injunctive relief analysis. *MGM*, 518 F. Supp. 2d at 1219. As explained above, it is impossible to quantify the harm that Epic has suffered. Moreover, no monetary award would enable Epic to freely compete in the iOS App Distribution Market or iOS In-App Payment Solutions Market, and Epic has not even sought such an award. Absent injunctive relief, Apple will continue harming Epic into the future. *See*

id. at 1220 (no adequate remedy at law where “[t]he only realistic method for remedying . . . future harm . . . is by way of a permanent injunction”).

491. *Third*, the balance of hardships tips in Epic’s favor. In considering the balance of hardships between the plaintiff and defendant, the Court “must consider the effect on each party of the granting or withholding of the requested relief”. *Klein v. City of San Clemente*, 584 F.3d 1196, 1199-1200 (9th Cir. 2009) (internal quotation marks omitted) (quoting *Winter v. Nat'l Res. Def. Council, Inc.*, 555 U.S. 7, 24 (2008)). The balance of hardships favors the plaintiff where “an injunction will merely prohibit [d]efendants from engaging in future unlawful activity”. *Entrepreneur Media, Inc. v. Dye*, No. SA CV 18-0341-DOC, 2018 WL 6118443, at *8 (C.D. Cal. Sept. 11, 2018). “There is no hardship to a defendant when a permanent injunction would merely require the defendant to comply with the law”. *Id.* (quoting *Deckers Outdoor Corp. v. Ozwear Connection Pty Ltd.*, No. CV 14-2307, 2014 WL 4679001, at *13 (C.D. Cal. Sept. 18, 2014)).

492. Epic is asking only that Apple be required to follow the law and cease its unlawful conduct in the iOS App Distribution Market and iOS In-App Payment Solutions Market. Contrary to Apple’s contention, Epic does not seek a compulsory license without compensation for Apple. Moreover, Apple already has the technological capability to permit secure third-party app distribution. (*See* § III.D above.) Apple can also de-couple app distribution from payment processing by simply eliminating certain contractual restrictions. (Findings of Fact § VII.) Because the Court has found that Apple’s conduct is unlawful, the injunction will cause no hardship to Apple. *See Entrepreneur Media*, 2018 WL 6118443, at *8; *Deckers*, 2014 WL 4679001, at *13.

493. Apple has complained that Epic’s requested remedy would “fundamentally alter the way in which Apple interacts with developers and consumers”, and “require Apple to rework its business operations” and to provide continuing technical support to Epic. (Apple’s 5/21/21 COL ¶¶ 646, 683.) But Apple did not prove this complaint at trial. Apple’s fact witnesses do not even know what Epic’s requested remedy is. (Schiller Trial Tr. 3185:11-13 (“Q. So you don’t actually know what request [Epic has] made to this Court, correct? A. I do not.”); Federighi Trial Tr. 3456:6 (“I actually don’t know what remedy Epic is proposing.”).) Two of Apple’s experts opined generally that Epic’s requested remedy would increase Apple’s costs, but neither made any effort to describe in detail or quantify these costs. (See Ex. Expert 12 (Malackowski) ¶¶ 68, 70; Malackowski Trial Tr. 3644:1-23, 3645:21-25; Ex. Expert 8 (Schmalensee) ¶ 145.) Because Apple did not prove any burden, the Court gives its complaint little weight.

494. Apple has argued that “misconduct by the plaintiff may be taken into account when a court is asked to impose an equitable remedy”. (Legal Framework (ECF No. 276) at 140 (citing *Heldman v. U.S. Lawn Tennis Ass’n*, 354 F. Supp. 1241, 1249 (S.D.N.Y. 1973))). But as explained above (*see* § II.D.i above), “[u]nclean hands’ has not been recognized as a defense to an antitrust action for many years”. *Memorex*, 555 F.2d at 1381. Because the restrictions that Epic challenged through its implementation of Epic direct payment in August 2020 were unlawful, Epic’s actions do not disentitle it to a remedy. Apple has proffered one dated and out-of-circuit district court case, which ruled only that unclean hands might apply at the preliminary injunction stage because “as of now, no violation of law by defendants has been tried, established or decided”. *Heldman*, 354 F. Supp. at 1249. Denying a

permanent injunction that would prohibit an *adjudicated* antitrust violator from violating the laws would clearly undermine Congressional policy in favor of enforcing the antitrust laws.

495. Even if unclean hands were applicable in determining the scope of the remedy, it does not apply here. The core of Apple's unclean hands defense is centered on Project Liberty, through which Epic brought its direct pay option to the iOS platform. While Epic did not disclose Project Liberty to Apple, Epic could not have disclosed it without causing Apple to reject Version 13.40 of *Fortnite* pursuant to Apple's anti-competitive restrictions. Epic did not behave inequitably by launching the direct pay option, let alone at a level that would deny it relief. *See Kaiser Steel*, 455 U.S. at 77 ("our cases leave no doubt that illegal promises will not be enforced in cases controlled by the federal law"); *Perma Life Mufflers*, 392 U.S. at 139 ("[T]he purposes of the antitrust laws are best served by insuring that the private action will be an ever-present threat to deter anyone contemplating business behavior in violation of the antitrust laws."); (*see* § II.D.i above.)

496. *Fourth*, the public interest is served by injunctive relief that calls an end to Apple's anti-competitive conduct. "[T]he public interest inquiry primarily addresses impact on non-parties rather than parties and takes into consideration" the "public consequences" of the injunction. *hiQ Labs, Inc. v. LinkedIn Corp.*, 938 F.3d 985, 1004 (9th Cir. 2019) (quotation marks omitted). The public interest favors enforcement of the antitrust laws. *See, e.g.*, *California v. Am. Stores Co.*, 495 U.S. 271, 284 (1990); *Optronic Techs. v. Ningbo Sunny Elec. Co.*, No. 5:16-cv-06370-EJD, 2020 WL 1812257, at *4, *8 (N.D. Cal. Apr. 9, 2020). Requiring Apple to allow competition in the iOS App Distribution Market and iOS In-App Payment Solutions Market will not impair the security, privacy or reliability of iOS devices. (*See*

§§ II.B.ii, IV.B.ii.a above); *see Am. Stores Co.*, 495 U.S. at 284; *Optronic Techs.*, 2020 WL 1812257, at *4, *8.

iii. The scope of Epic's requested injunction is proper.

497. Although this is a private action rather than a government enforcement action, that does not mean the Court is unable to afford proper relief. “Broad equitable remedies have received the same approval in private antitrust actions.” *In re Data Gen. Corp.*, 1986 WL 10899, at *4 (collecting cases). “Once plaintiffs establish they are entitled to injunctive relief, the district court has broad discretion in fashioning a remedy.” *Orantes-Hernandez v. Thornburgh*, 919 F.2d 549, 558 (9th Cir. 1990). The relief ordered should be based “on some clear ‘indication of a significant causal connection between the conduct enjoined or mandated and the violation found directed toward the remedial goal intended’”. *Microsoft*, 253 F.3d at 105 (quoting 3 Phillip E. Areeda & Herbert Hovenkamp, *Antitrust Law* ¶ 653(b), at 91-92 (1996)). “An injunction in an antitrust case need not be limited to the acts described at trial but may extend even to acts that would be entirely legal if considered in a vacuum.” *Data Gen.*, 1986 WL 10899, at *4 (citing *United States v. U.S. Gypsum Co.*, 340 U.S. 76, 88-89 (1950)).

498. An order granting an injunction must “state the reasons why it issued,” “state its terms specifically,” and “describe in reasonable detail—and not by referring to the complaint or other document—the act or acts restrained or required”. Fed. R. Civ. P. 65(d)(1); *see also United States v. Holtzman*, 762 F.2d 720, 726 (9th Cir. 1985) (an injunction must be “reasonably clear so that ordinary persons will know precisely what action is proscribed”).

499. Epic's requested injunction is appropriately tailored with respect to the conduct enjoined (*see* § XII.A.iii.a below), the persons affected (*see* § XII.A.iii.b below) and its geographic reach (*see* § XII.A.iii.c below).

a. *Conduct enjoined.*

500. An injunctive order should represent "a reasonable method of eliminating the consequences of the illegal conduct". *Nat'l Soc'y of Prof'l Engineers v. United States*, 435 U.S. 679, 698 (1978). Pursuant to their broad discretionary powers, district courts are empowered to frame relief that is both suitable and necessary to address the anti-competitive effects of a defendant's illegal conduct. *See Besser Mfg. Co. v. United States*, 343 U.S. 444, 449 (1952); *United States v. E. I. du Pont de Nemours & Co.*, 366 U.S. 316, 322-23 (1961); *Data Gen.*, 1986 WL 10899, at *5 ("The injunction should be adequate to 'cure the ill effects of the illegal conduct, and assure the public freedom from its continuance.'" (quoting *Gypsum*, 340 U.S. at 88)).

501. **iOS App Distribution Market.** Because Epic has prevailed on Counts 1, 2, and 3 of its Complaint, Epic is entitled to an order enjoining Apple from undertaking the four specific types of conduct described below; an anti-circumvention order; and an anti-retaliation order. (*See* App'x 1.)

502. *First*, the Court hereby "[e]njoin[s] Apple from further violations of Section 1 and/or Section 2 of the Sherman Act, the Cartwright Act and/or the California Unfair Competition Law with respect to the iOS App Distribution Market and/or the App Store on the iOS platform". (App'x 1.) This relief is appropriate because a court may enter an order that "den[ies] to the defendant the fruits of its statutory violation, and ensure[s] that there remain no

practices likely to result in monopolization in the future". *Microsoft*, 253 F.3d at 103 (quoting *United States v. United Shoe Mach. Corp.*, 391 U.S. 244, 250 (1968)). Similarly, a court may enjoin "acts [of the defendant] which are of the same type or class as unlawful acts which the court has found to have been committed or whose commission in the future unless enjoined, may fairly be anticipated from the defendant's conduct in the past". *Zenith Radio Corp. v. Hazeltine Research, Inc.*, 395 U.S. 100, 132 (1969). If Apple could continue to violate the antitrust laws after being found liable in this case, Epic's victory would be hollow.

503. *Second*, the Court hereby "[e]njoin[s] Apple from restricting, prohibiting, impeding or deterring the distribution of iOS apps through a distribution channel other than the App Store". (App'x 1 (footnote omitted).) A court may enjoin a defendant from "us[ing] its monopoly to destroy threatened competition". *Lorain Journal Co. v. United States*, 342 U.S. 143, 154 (1951). Similarly, a court may enjoin a defendant from preventing market participants from "exercis[ing] new-found freedoms offered by the remedy in [an antitrust] case". *New York v. Microsoft Corp.*, 224 F. Supp. 2d 76, 163 (D.D.C. 2002), *aff'd sub nom. Massachusetts v. Microsoft Corp.*, 373 F.3d 1199 (D.C. Cir. 2004); *see also id.* at 266-77 (Appendix B Final Judgment). This relief is central to remedying Apple's anti-competitive conduct because it will open up the iOS App Distribution Market to competition.

504. *Third*, the Court hereby "[e]njoin[s] Apple from discriminating against or disadvantaging iOS app distribution through channels other than the App Store". (App'x 1.) This relief is appropriate because a court may enjoin a defendant from engaging in discriminatory practices that are "designed to operate as, and do[] operate as, a method of excluding" competitors from the market. *United States v. United Shoe Mach. Corp.*, 110 F.

Supp. 295, 321, 352 (D. Mass. 1953), *aff'd*, 347 U.S. 521 (1954). Similarly, a court may enter an order that requires a defendant to offer market participants “nondiscriminatory terms and prices”. *Kodak*, 125 F.3d at 1201, 1225. If alternative methods of app distribution are permitted on iOS but Apple can discriminate against them in favor of its own App Store, then consumers and developers are unlikely to realize the benefits of competition.

505. *Fourth*, the Court hereby “grant[s] the following time-limited relief, which shall be effective from the date of this Order for a period of three (3) years”. The Court “[e]njoin[s] Apple from enforcing contractual provisions, guidelines or policies, or imposing technical restrictions, that restrict, prohibit, impede or deter distribution of iOS app stores through the App Store”. (App'x 1.) This relief is appropriate to remedy Apple's past misconduct and its anti-competitive effects in the iOS App Distribution Market and other relevant markets, and in order to restore competition in the iOS App Distribution Market. A court may enter an order that “eliminat[es] the consequences of the [defendant's] illegal conduct”. *Nat'l Soc'y of Prof'l Eng'rs v. United States*, 435 U.S. 679, 698 (1978). Given Apple's longstanding restrictions on the iOS App Distribution Market, the App Store has an extraordinary lead over other app stores, which is all the more meaningful because competing app stores will need to overcome the “chicken and egg” problem associated with indirect network effects. Permitting new app stores to be distributed on Apple's App Store for three years (roughly the lifespan of a smartphone), will give new app stores a reasonable period of time to gain exposure and an opportunity to become real competitive threats to Apple's App Store.

506. *Fifth*, the Court hereby “enjoin[s] Apple from circumventing th[e] Order by taking steps that violate the purpose, if not the terms, of th[e] Order, including by imposing disincentives or providing incentives that are designed to, and have the effect of, making real competition in the iOS App Distribution Market and/or the iOS In-App Payment Solutions Market impracticable”. (App’x 1.) Anti-circumvention orders like this are common features of antitrust injunctions. *See, e.g.*, *Nat'l Soc. of Pro. Eng'rs*, 435 U.S. at 698 (“While [the injunction] goes beyond a simple proscription against the precise conduct previously pursued[,] that is entirely appropriate.”); *Microsoft*, 224 F. Supp. 2d at 163 (“Given the power wielded by a monopolist like Microsoft, in the absence of protection against retaliation and threats of retaliation, industry participants whose survival hinges on their relationship with such a monopolist will be reluctant to exercise the new-found freedoms offered by the remedy in this case.”). Epic and the Court cannot foresee all possible steps that Apple may take to undermine the purpose of Epic’s requested injunction. Thus, Apple should be prohibited from violating both the letter and purpose of the injunction.

507. *Sixth*, the Court hereby “permanently enjoin[s] Apple from taking any retaliatory actions against Epic or any of its affiliates in connection with or based on Epic’s filing of this Action, the August 2020 enablement of a direct payment option in *Fortnite*, or the steps Epic took to enable that option (‘Prior Epic Actions’). For the avoidance of doubt, prohibited retaliatory actions include conduct by Apple that denies *Fortnite* access to Apple’s App Store on the basis of such Prior Epic Actions.” (App’x 1.) Epic undertook the Prior Epic Actions to enforce the antitrust laws. In retaliation against Epic for the Prior Epic Actions, Apple has terminated Epic’s Developer Program account, removed *Fortnite* from the App Store, and

threatened to revoke access to iOS and macOS developer tools necessary to support *Unreal Engine* and to terminate Epic's affiliates' Developer Program accounts. If courts fail to protect successful plaintiffs from retaliation by adjudicated antitrust violators, then the Congressional policy in favor of enforcing antitrust laws will be chilled. *See, e.g., Acquaire*, 24 F.3d at 411-12 (affirming injunction prohibiting defendant beverage company from retaliating against distributors that defied its unlawful policy); *Milsen Co. v. Southland Corp.*, 454 F.2d 363, 369 (7th Cir. 1971) (reversing denial of preliminary injunction because courts "have refused to permit a party to benefit from contractual rights when the contract is an instrument of restraint of trade"); *Microsoft*, 224 F. Supp. 2d at 162-63.

508. iOS In-App Payment Solutions Market. Because Epic has prevailed on Counts 4, 5, and 6 of its Complaint, Epic is entitled to an order enjoining Apple from undertaking the four specific types of conduct described below; an anti-circumvention order; and an anti-retaliation order. (*See App'x 1.*)²²

509. First, the Court hereby "[e]njoin[s] Apple from further violations of Section 1 and/or Section 2 of the Sherman Act, the Cartwright Act and/or the California Unfair Competition Law with respect to the iOS In-App Payment Solutions Market". (*App'x 1.*) As explained above (*see ¶¶ 502-507*), this type of injunction is a common remedy to prevent repetition of antitrust violations. *See Microsoft*, 253 F.3d at 103; *Zenith*, 395 U.S. at 132.

²² In the interest of brevity, the Court will not repeat its discussion of the anti-circumvention and anti-retaliation orders in the prior section.

510. *Second*, the Court hereby “[e]njoin[s] Apple from restricting, prohibiting, impeding or deterring the use of in-app payment processors other than Apple’s IAP”. (App’x 1.) This remedy is the core relief necessary to open up competition in the iOS In-App Payment Solutions Market. *See Microsoft*, 224 F. Supp. 2d at 163.

511. *Third*, the Court hereby “[e]njoin[s] Apple from discriminating against payment processors other than Apple’s IAP, iOS developers that use payment processors other than Apple’s IAP, or iOS apps or app stores that use payment processors other than Apple’s IAP”. (App’x 1.) As explained above (*see ¶¶ 502-507*), such non-discrimination injunctions are an appropriate way of preventing the defendant from undermining the core relief. *See United Shoe*, 110 F. Supp. at 321, 352; *Eastman Kodak*, 125 F.3d at 1201, 1225-26.

512. *Fourth*, the Court hereby “[e]njoin[s] Apple from imposing a financial penalty or technical limitation on access to the iOS platform by iOS apps (including iOS app stores) that use payment processing solutions other than or in addition to Apple’s IAP”. (App’x 1.) This injunction is also necessary to prevent Apple from tilting the playing field in its favor by penalizing developers or app distributors for choosing alternative payment solutions. *See Nat’l Soc’y of Prof’l Eng’rs*, 435 U.S. at 698.

* * *

513. Apple argues that Epic has “made no evidentiary presentation to defend its proposed injunction”. (Apple’s 5/21/21 COL ¶ 649.1.) The Court disagrees. Epic presented evidence that on platforms unburdened by the restrictions imposed by Apple on iOS, there is vigorous competition and innovation for app distribution and payment solutions. (Ex. Expert 1 (Evans) ¶¶ 165, 167, 246; Findings of Fact ¶¶ 305, 306, 352, 359, 361.) The Court infers that

users and developers on iOS will experience similar benefits after Apple’s restrictions are enjoined. Epic also presented evidence that macOS is a secure and open platform (Findings of Fact § XI.D), and that Apple could implement the same security protections from macOS on iOS (Federighi Trial Tr. 3473:2-4). And Epic presented evidence that Apple makes money hand over fist from iOS, and will continue to do so even without monopolies on app distribution and payment solutions. (Findings of Fact § II.F.) Although Apple faults Epic’s experts for not answering certain questions about the scope of Epic’s remedy (*see* Apple’s 5/21/21 COL ¶ 649.1), those questions called for legal opinions. Epic’s remedy is well-grounded in the evidence.

b. Persons affected.

514. In private antitrust actions, courts “possess[] broad power to fashion the equitable relief necessary to halt conduct in violation of the Sherman Act. . . . Antitrust relief should unfetter a market from anticompetitive conduct and pry open to competition a market that has been closed by illegal restraints.” *Gen. Atomic Co. v. Exxon Nuclear Co.*, No. 78-223-E, 1979 WL 1708, at *3 (S.D. Cal. Sept. 6, 1979); *see Data Gen.*, 1986 WL 10899, at *4 (recognizing approval by courts of “[b]road equitable remedies . . . in private antitrust actions”). For that reason, the relief “should not myopically focus solely on [plaintiff]’s harm”. *Cont'l Airlines, Inc. v. United Air Lines, Inc.*, 136 F. Supp. 2d 542, 550 (E.D. Va. 2001), *vacated on other grounds*, 277 F.3d 499 (4th Cir. 2002) (quotation marks omitted). “There is no general requirement that an injunction affect only the parties in the suit.” *Bresgal v. Brock*, 843 F.2d 1163, 1169 (9th Cir. 1987). “[A]n injunction is not necessarily made over-broad by extending benefit or protection to persons other than prevailing parties in the lawsuit—even if it is not a

class action—if such breadth is necessary to give prevailing parties the relief to which they are entitled’. *Id.* at 1170-71 (emphasis in original); *see also, e.g., Kodak*, 125 F.3d at 1226 (affirming injunction as to non-party market participants affected by illegal tying arrangement as “proper under these circumstances” (citing *Hawaii v. Standard Oil Co.*, 405 U.S. 251, 261 (1971) (“While . . . any individual threatened with injury by an antitrust violation may . . . sue for injunctive relief . . . one injunction is as effective as 100”))). The Court should not limit the injunction to apply only to Epic because remedying Epic’s harm requires open competition in the iOS App Distribution Market and iOS In-App Payment Solutions Market.

515. The injunction opens iOS to alternative app stores—not just EGS. As a developer, Epic will benefit from having multiple channels to distribute its apps on iOS and to enjoy the benefits of innovation from competition on iOS. Epic could not enjoy these benefits if the only options are self-distribution or Apple’s App Store. For similar reasons, the injunction requires Apple to permit all developers—not just Epic—to directly distribute their apps to users on iOS. Direct distribution on iOS will place competitive pressure on app stores, from which Epic will benefit as a developer.

516. The injunction is not limited to permitting only Epic to use or provide non-IAP payment solutions. Alternative providers will be far less likely to enter the iOS In-App Payment Solutions Market and invest in innovation if their only potential customer is Epic. The market has to be freed for Epic to enjoy the benefits of competition.

517. The Court has previously raised concerns about whether there is precedent for such an injunction in a private antitrust action, but such precedent does exist. For example, in *In re Data General Corp. Antitrust Litigation*, following a decision by the Ninth Circuit that the

defendant's refusal to license its computer operating system software except to purchasers of its central processing units was an unlawful tying arrangement, the district court found a broad equitable remedy appropriate and issued a permanent injunction requiring, among other things, that the defendant allow all of its customers (not just the private plaintiffs who had brought the suit) to use its operating system software with any central processing unit, whether or not sold by the defendant. *See Data Gen.*, 1986 WL 10899, at *8-10. The scope of commerce at stake under that injunction was significant; the plaintiffs had established that the defendant "sold and shipped approximately 52,700 [central processing units] between 1970 and 1978, and that in 1977 alone its shipments were valued at \$254,000,000". *In re Data Gen. Corp. Antitrust Litigation*, 529 F. Supp. 801, 807 (N.D. Cal. 1981), *rev'd in part*, 724 F.2d 1336 (9th Cir. 1984).

c. *Geographic reach.*

518. The injunction applies globally, excluding China. The Court has the ability to order Apple, located here in the United States, to take the necessary actions to effectuate this order. The global reach of the injunction is consistent with the geographic scope of the markets and conduct at issue. The U.S. Supreme Court has interpreted Section 16 of the Clayton Act to permit global injunctions. *See Zenith*, 395 U.S. at 132-33 (upholding an injunction "barr[ing defendant] from conspiring with others to restrict or prevent [plaintiff] from entering any . . . foreign market" where plaintiff was "interested in expanding its foreign commerce and . . . suffered at the hands of [defendant]").

519. If Epic were able to operate EGS on iOS, it would distribute apps globally and make Epic direct payment available to apps distributed by EGS globally, just as it does on PC and Macs. (Findings of Fact ¶¶ 435, 477, 479, 480, 484, 541.) Similarly, as a developer,

Epic wishes to make its own apps available globally and to sell in-app purchases globally. (*Id.*) Only a global injunction will allow Epic to compete where it intends and to reach the consumers it needs. *See Zenith Radio*, 395 U.S. at 132-33.

520. Apple has argued that “[t]he FTAIA on its face limits the geographic reach of any injunction”. (Legal Framework (ECF No. 276) at 149.) This is wrong. The FTAIA says nothing about injunctions on its face. *See* 15 U.S.C. § 6a. To the contrary, “[t]he FTAIA does not limit the power of the federal courts; rather, it provides substantive elements under the Sherman Act in cases involving nonimport trade with foreign nations”. *United States v. Hui Hsiung*, 778 F.3d 738, 753 (9th Cir. 2015). Thus, the FTAIA does not limit the scope of the injunctive relief the Court has the power to order.

B. Epic is entitled to a permanent injunction for its California law claims.

521. Epic is also entitled to a permanent injunction under the Cartwright Act (*see* § XII.B.i below), and the UCL (*see* § XII.B.ii below).

i. California Cartwright Act.

522. Under the Cartwright Act, “[a]ny person who is injured in his or her business or property by reason of anything forbidden or declared unlawful by this chapter, may sue therefor” to obtain “preliminary or permanent injunctive relief when and under the same conditions and principles as injunctive relief is granted by courts generally under the laws of this state and the rules governing these proceedings”. Cal. Bus. & Prof. Code § 16750(a).

523. As explained above, “[t]he Cartwright Act is broader in range and deeper in reach than the Sherman Act”. *In re Cipro Cases*, 61 Cal. 4th at 161 (quoting *Cianci*, 40 Cal. 3d at 920) (internal quotation marks omitted); (*see* §§ VIII-X above).

524. There are no material differences between federal antitrust law and the Cartwright Act that would limit the scope of Epic’s requested injunction under the Cartwright Act. Therefore, because Epic has prevailed on Counts 7, 8, and 9, Epic is entitled to the same injunction under the Cartwright Act to which it is entitled under the Clayton Act. (See § XII.A above.)

525. Apple has argued that “[i]njunctive relief obtained under the Cartwright Act may not extend outside of California”. (Legal Framework (ECF No. 276) at 151 (citing *Healy v. Beer Inst., Inc.*, 491 U.S. 324, 336 (1989))). This is contrary to the California Supreme Court’s holding in *Younger v. Jensen*, which applied the Cartwright Act to “interstate and intra-California aspects” of an investigation when the interstate aspects “significantly affect[ed]” California’s interests. 26 Cal. 3d 397, 405-06 (1980); *see also id.* at 405 (“Obviously there is an overlap between coverages of the Sherman Act and state antitrust laws that prohibit substantially the same conduct, such as California’s Cartwright Act. Neither the Sherman Act nor the federal prohibition of undue burdens on interstate commerce prevents those state laws from reaching transactions that have interstate aspects but significantly affect state interests” (citations omitted)). Apple’s interstate conduct significantly affects California’s interests because Apple’s foreclosure of the iOS App Distribution Market harms many developers and consumers in California. Moreover, Apple’s cited authority addressed the application of state law to “commerce that takes place wholly outside of the State’s borders”. *Healy*, 491 U.S. at 336. But California is Apple’s principal place of business and state of incorporation. (DX-4581.001.) And California law governs the DPLA (PX-2619 (DPLA) § 14.10)—one of the central contracts in this case. The commerce at issue in this case clearly takes place at least in part in California.

ii. California UCL.

526. Under the UCL, “[a]ny person who engages, has engaged, or proposes to engage in unfair competition may be enjoined in any court of competent jurisdiction. The court may make such orders or judgments, including the appointment of a receiver, as may be necessary to prevent the use or employment by any person of any practice which constitutes unfair competition, as defined in this chapter, or as may be necessary to restore to any person in interest any money or property, real or personal, which may have been acquired by means of such unfair competition”. Cal. Bus. & Prof. Code § 17203.

527. “[T]he primary form of relief available under the UCL to protect consumers from unfair business practices is an injunction”. *In re Tobacco II Cases*, 46 Cal. 4th 298, 319 (2009). A private party seeking injunctive relief under the UCL may request “public injunctive relief”, *McGill v. Citibank, N.A.*, 2 Cal. 5th 945, 954 (2017), which is “relief that by and large benefits the general public and that benefits the plaintiff, if at all, only incidentally and/or as a member of the general public”, *id.* at 955 (citations, quotation marks and alterations omitted). Thus, the Court has even greater authority to extend an injunction under the UCL to third parties that are also affected by Apple’s unlawful conduct than under federal law.

528. There are no material differences between federal antitrust law and the UCL that would limit the scope of Epic’s requested injunction under the UCL. Therefore, because Epic has prevailed on Count 10, Epic is entitled to the same injunction under the UCL to which it is entitled under the Clayton Act. (*See* § XII.A above.)

529. Apple argues that “[a] plaintiff seeking equitable relief from a federal court under state law must meet two requirements”. (Legal Framework (ECF No. 276) at 152-

53.) The first purported requirement is that the plaintiff must show “that no adequate remedy at law exists”. *Id.* Epic has satisfied this requirement. (*See* § XII.A.ii above.) The second purported requirement is that “the plaintiff must ‘disprove[]’ the adequacy of an alternative remedy”. (Legal Framework (ECF No. 276) at 152-53.) This is not a requirement. Apple’s cited cases simply involved situations where the plaintiffs sought damages in addition to equitable relief, and Epic does not seek damages. *See Anderson v. Apple Inc.*, No. 20-CV-2328, 2020 WL 6710101, at *7 (N.D. Cal. Nov. 16, 2020) (“Because [the plaintiffs] also request money damages, it is possible their legal remedy is sufficient; on this record, they have not yet disproven that.”); *Bird v. First Alert, Inc.*, No. C 14-3585 PJH, 2014 WL 7248734, at *5 (N.D. Cal. Dec. 19, 2014) (finding, where “plaintiff is seeking damages under the CLRA”, that damages were an adequate remedy at law).

XIII. APPLE IS NOT ENTITLED TO RELIEF ON ITS COUNTERCLAIMS.

530. Finally, the Court addresses the five counterclaims alleged by Apple against Epic. (*See* §§ XIII.A-E below.) The Court denies relief on each.

A. Apple is not entitled to relief because the challenged provisions of the DPLA and Schedule 2 are unlawful, void as against public policy, and unconscionable (Count 1).

531. Apple alleges that Epic breached five provisions of the DPLA (§§ 3.2(f), 3.3.2, 3.3.3, 3.3.25, 6.1) and one provision of Schedule 2 (§ 3.4), and seeks “[a]n award of compensatory damages in the amounts Epic contractually agreed to pay to Apple under the Apple Developer Program License Agreement, including 30% of in-app purchases made by iOS end users via Epic Direct Payment”. (*See* Legal Framework, App’x A (ECF No. 276-1) at 8; *see also* Apple’s Answer (ECF No. 66) at pp. 56-57.)

532. The DPLA is “governed by and construed in accordance with the laws of the United States and the State of California”. (PX-2619 (DPLA) § 14.10.) Under California law, “the elements of a cause of action for breach of contract are (1) the existence of the contract, (2) plaintiff’s performance or excuse for nonperformance, (3) defendant’s breach, and (4) the resulting damages to the plaintiff”. *Oasis W. Realty, LLC v. Goldman*, 51 Cal. 4th 811, 821 (2011); *see* CACI No. 303 (2020).

533. Epic does not contest that it breached the DPLA and Schedule 2. Nor does Epic contest that if the Court finds the breached provisions enforceable against Epic in this matter, then Epic would be liable to Apple for breach of contract in an amount equal to 30% of in-app purchases made by end users on the *Fortnite* iOS app via Epic direct payment.

534. But because these contracts are *not* lawful, Apple is entitled to nothing. The Court upholds Epic’s defenses that the challenged provisions of the DPLA and Schedule 2 are unenforceable under the doctrine of illegality (see § XIII.A.i below); void as against public policy (*see* § XIII.A.ii below); and unconscionable (*see* § XIII.A.iii below).

- i. The challenged provisions of the DPLA and Schedule 2 are illegal under the antitrust laws (Affirmative Defenses 1 and 2).

535. Epic has pleaded that Apple’s claims are barred in whole or in part because the contractual provisions on which they are based are unlawful under Sections 1 and 2 of the Sherman Act, the Cartwright Act, and the UCL. (Epic’s Answer (ECF No. 106) at p. 17 (Affirmative Defenses 1 and 2).)

536. **Federal Law.** “The authorities from the earliest time to the present unanimously hold that no court will lend its assistance in any way towards carrying out the terms

of an illegal contract.” *McMullen*, 174 U.S. at 654. “In such cases the aid of the court is denied, not for the benefit of the [non-complying party], but because public policy demands that it should be denied.” *Cont'l Wall Paper*, 212 U.S. at 262; *see also Kaiser Steel*, 455 U.S. at 77 (“our cases leave no doubt that illegal promises will not be enforced in cases controlled by the federal law”).

537. “[T]he illegality defense should be entertained in those circumstances where its rejection would be to enforce conduct that the antitrust laws forbid.” *Kaiser Steel*, 455 U.S. at 81-82. Courts decline to enforce a contract as in violation of the Sherman Act if “the judgment of the Court would itself be enforcing the precise conduct made unlawful by [the antitrust laws]”. *Kelly v. Kosuga*, 358 U.S. 516, 520 (1959); *see also Bassidji v. Goe*, 413 F.3d 928, 936 (9th Cir. 2005) (“Both federal law and California law begin from the core proposition that whatever flexibility may otherwise exist with regard to the enforcement of ‘illegal’ contracts, courts will not order a party to a contract to perform an act that is in direct violation of a positive law directive, even if that party has agreed, for consideration, to perform that act.”).

538. **California Law.** “The object of a contract must be lawful when the contract is made.” Cal. Civ. Code § 1596. Among other possibilities, a contract is unlawful if it is (1) “[c]ontrary to an express provision of law,” (2) “[c]ontrary to the policy of express law, though not expressly prohibited,” or (3) “[o]therwise contrary to good morals”. Cal. Civ. Code § 1667.

539. “There is no doubt that the general rule requires the courts to withhold relief under the terms of an illegal contract or agreement which is violative of public policy.” *Tri-Q, Inc. v. Sta-Hi Corp.*, 63 Cal. 2d 199, 218 (1965); *see Tiedje v. Aluminum Taper Milling*

Co., 46 Cal. 2d 450, 453-54 (1956) (“A contract made contrary to public policy or against the express mandate of a statute may not serve as the foundation of any action, either in law or in equity.”). “These rules are intended to prevent the guilty party from reaping the benefit of his wrongful conduct, or to protect the public from the future consequences of an illegal contract.” *Tri-Q*, 63 Cal. 2d at 218.

540. “The burden ordinarily rests upon the party asserting the invalidity of the contract to show how and why it is unlawful.” *Rock River Commc’ns, Inc. v. Universal Music Grp., Inc.*, 745 F.3d 343, 350 (9th Cir. 2014) (quoting *Morey v. Paladini*, 187 Cal. 727, 734 (1922)).

541. **Application.** The challenged provisions of the DPLA and Schedule 2 are unlawful under federal and California law. Those provisions are non-negotiable terms in contracts of adhesion into which Apple forces developers to enter by means of its market power. (Findings of Fact § IV.A.) Those provisions reinforce Apple’s market power in the iOS App Distribution Market and iOS In-App Payment Solutions Market by requiring the exclusive use of Apple’s App Store and Apple’s IAP, prohibiting all alternative app stores and all non-IAP payment solutions, and imposing Apple’s supra-competitive 30% commission. These provisions are unlawful for the reasons previously explained. (*See §§ II-XI above.*)

542. Apple responds that “[t]here is no serious question that the 30% commission Epic is obligated to pay Apple represents a ‘fair price’”, and that “Epic’s affirmative defense of illegality” does not defeat liability for Epic “not remitting the commission to Apple”. (Apple’s 5/21/21 COL ¶¶ 783-87.) But the Court has already concluded that Apple’s 30% commission is distinguishable from the 30% commissions charged by some other platforms, and

is the result of Apple's monopoly power. (*See* Findings of Fact § IV.C.) Apple made no effort to value its intellectual property other than by comparing itself to these other platforms. (*See* Malackowski Trial Tr. 3658:10-12 ("Q. . . . You did not do any work to try to put a dollar amount on any single or collection of Apple's IP, right? A. Correct."). Therefore, "to give judgment for the excessive . . . price . . . in favor of [Apple] would be to make the courts a party to the carrying out of one of the very restraints forbidden by the Sherman Act". *See Kelly*, 358 U.S. at 520.

543. Because enforcing the challenged provisions of the DPLA and Schedule 2 would further Apple's anti-competitive conduct, the Court denies Apple's breach of contract counterclaim. *See McMullen*, 174 U.S. at 654; *Cont'l Wall Paper*, 212 U.S. at 262; *Kaiser Steel*, 455 U.S. at 77.

ii. The challenged provisions of the DPLA and Schedule 2 are void as against public policy (Affirmative Defense 3).

544. Epic has pleaded that Apple's claims are barred in whole or in part because the contractual provisions on which they are based are void as against public policy. (Epic's Answer (ECF No. 106) at p. 17 (Affirmative Defense 3).)

545. "That is not lawful which is . . . [c]ontrary to the policy of express law, though not expressly prohibited." Cal. Civ. Code § 1667(2); *see also Kelton v. Stravinski*, 138 Cal. App. 4th 941, 949 (2006) ("In general, a contract contrary to public policy will not be enforced."); *Altschul v. Sayble*, 83 Cal. App. 3d 153, 162 (1978) ("There is no requirement that a contract violate an express mandate of a statute before it may be declared void as contrary to public policy.").

546. “The authorities all agree that a contract is not void as against public policy unless it is injurious to the interests of the public as a whole or contravenes some established interest of society.” *Rosenberg v. Raskin*, 80 Cal. App. 2d 335, 338 (1947). “California has a settled public policy in favor of open competition.” *Kelton*, 138 Cal. App. 4th at 946; *see also Margolin v. Shemaria*, 85 Cal. App. 4th 891, 901 (2000) (“Both legislative enactments and administrative regulations can be utilized to further this state’s public policy of protecting consumers in the marketplace of goods and services.”). A provision in a contract that obligates a party to the contract to violate the antitrust laws is void as against public policy. *See Foley v. Interactive Data Corp.*, 47 Cal. 3d 654, 713 n.12 (1988) (citing *Tameny v. Atlantic Richfield Co.*, 27 Cal. 3d 167 (1980)).

547. The challenged provisions of the DPLA and Schedule 2 are void as against public policy for reasons similar to why they are illegal. Apple uses its market power to force developers to enter into those provisions; they foreclose all alternative app stores and non-IAP payment solutions in the iOS App Distribution Market and iOS In-App Payment Solutions Market, respectively; and they facilitate the imposition of Apple’s supra-competitive 30% commission. (*See* § XIII.A.i above.) The Court denies Apple’s breach of contract claim because the contractual provisions on which it is based undermine the public policy in favor of competitive markets.

iii. The challenged provisions of the DPLA and Schedule 2 are unconscionable (Affirmative Defense 4).

548. Epic has pleaded Apple's claims are barred in whole or in part because the challenged provisions of the DPLA and Schedule 2 are unconscionable. (Epic's Answer (ECF No. 106) at pp. 17-18 (Affirmative Defense 4).)

549. “[A] contract or provision, even if consistent with the reasonable expectations of the parties, will be denied enforcement if, considered in its context, it is unduly oppressive or ‘unconscionable.’” *Graham v. Scissor-Tail, Inc.*, 28 Cal. 3d 807, 820 (1981). “Unconscionability has generally been recognized to include an absence of meaningful choice on the part of one of the parties together with contract terms which are unreasonably favorable to the other party. Phrased another way, unconscionability has both a ‘procedural’ and a ‘substantive’ element. . . . [B]oth the procedural and substantive elements must be met before a contract or term will be deemed unconscionable. Both, however, need not be present to the same degree. A sliding scale is applied so that ‘the more substantively oppressive the contract term, the less evidence of procedural unconscionability is required to come to the conclusion that the term is unenforceable, and vice versa.’” *Lhotka v. Geographic Expeditions, Inc.*, 181 Cal. App. 4th 816, 821 (2010) (internal quotation marks and citations omitted). “If the court as a matter of law finds the contract or any clause of the contract to have been unconscionable at the time it was made the court may refuse to enforce the contract, or it may enforce the remainder of the contract without the unconscionable clause, or it may so limit the application of any unconscionable clause as to avoid any unconscionable result.” Cal. Civil Code § 1670.5(a);

Graham, 28 Cal. 3d at 820 n.19 (citing Cal. Civil Code § 1670.5) (“The judicially developed concept of unconscionability has recently become a part of our statutory law.”).

550. “The procedural element of the unconscionability analysis concerns the manner in which the contract was negotiated and the circumstances of the parties at that time. The element focuses on oppression or surprise. Oppression arises from an inequality of bargaining power that results in no real negotiation and an absence of meaningful choice. Surprise is defined as the extent to which the supposedly agreed-upon terms of the bargain are hidden in the prolix printed form drafted by the party seeking to enforce the disputed terms.”

Gatton v. T-Mobile USA, Inc., 152 Cal. App. 4th 571, 581 (2007) (internal quotation marks and citations omitted). “Unconscionability analysis begins with an inquiry into whether the contract is one of adhesion. The term contract of adhesion signifies a standardized contract, which, imposed and drafted by the party of superior bargaining strength, relegates to the subscribing party only the opportunity to adhere to the contract or reject it.” *Armendariz v. Found. Health Psychcare Servs., Inc.*, 24 Cal. 4th 83, 113 (2000) (quotation marks and alterations omitted).

551. “The substantive element of the unconscionability analysis focuses on overly harsh or one-sided results,” *Gatton*, 152 Cal. App. 4th at 586, or “whether a contractual provision reallocates risks in an objectively unreasonable or unexpected manner,” *Lhotka*, 181 Cal. App. 4th at 821. Substantive unconscionability “traditionally involves contract terms that are so one-sided as to ‘shock the conscience,’ or that impose harsh or oppressive terms”. *Wherry v. Award, Inc.*, 192 Cal. App. 4th 1242, 1248 (2011).

552. The challenged provisions of the DPLA and Schedule 2 are unconscionable for reasons similar to why they are illegal and void as against public policy.

They are procedurally unconscionable because they are non-negotiable terms in contracts of adhesion. Apple does not negotiate these terms, and developers, who have to be on iOS to monetize their apps, have no choice but to enter into them. (Findings of Fact § IV.A.) The challenged provisions of the DPLA and Schedule 2 are also substantively unconscionable because they foreclose all alternative app stores and non-IAP payment solutions in the iOS App Distribution Market and iOS In-App Payment Solutions Market, respectively, and they facilitate the imposition of Apple’s supra-competitive 30% commission. (*See* § XIII.A.i above.) The Court denies Apple’s breach of contract claim because the contract provisions on which it is based are unconscionable.

B. Apple’s implied covenant claim entitles Apple to no more than Apple’s breach of contract claim (Count 2).

553. Apple has alleged an implied covenant claim against Epic based on the same conduct and seeking the same damages as Apple’s breach of contract claim. (*See* Legal Framework, App’x A (ECF No. 276-1) at 8; *see also* Apple’s Answer (ECF No. 66) at pp. 56-58.)

554. “In California, the factual elements necessary to establish a breach of the covenant of good faith and fair dealing are: (1) the parties entered into a contract; (2) the plaintiff fulfilled his obligations under the contract; (3) any conditions precedent to the defendant’s performance occurred; (4) the defendant unfairly interfered with the plaintiff’s rights to receive the benefits of the contract; and (5) the plaintiff was harmed by the defendant’s conduct.”

Rosenfeld v. JPMorgan Chase Bank, N.A., 732 F. Supp. 2d 952, 968 (N.D. Cal. 2010) (citing CACI No. 325 (2020)).

555. Apple's implied covenant claim fails because the contractual provisions on which it is based are unlawful. *Toce v. Rentch*, No. 17-cv-0603-AJB-BLM, 2018 WL 5994598, at *12 (S.D. Cal. Nov. 15, 2018) (granting summary judgment against implied covenant claim because "the terms of the Campaign Agreement are illegal").

556. Further, even if the contractual provisions were lawful (which they are not), Apple still would not be entitled to double recovery for its implied covenant claim. Both causes of action "are limited to contract damages". *Applied Equip. Corp. v. Litton Saudi Arabia Ltd.*, 7 Cal. 4th 503, 516 (1994) (internal quotation marks and citation omitted).

557. Because the Court has found that the challenged provisions of the DPLA and Schedule 2 are unlawful, Apple cannot recover on an implied covenant claim arising from the same provisions. The Court denies relief on Count 2.

C. Apple is not entitled to recover on its quasi-contract / unjust enrichment claim (Count 3).

558. Apple alleges an unjust enrichment claim "[i]n the alternative", seeking the same damages as its breach of contract claim. (Apple's Answer (ECF No. 66) at p. 58; Legal Framework, App'x A (ECF No. 276-1) at 8.)

559. "The elements of unjust enrichment are 'receipt of a benefit and unjust retention of the benefit at the expense of another.'" *Berger v. Home Depot USA, Inc.*, 741 F.3d 1061, 1070 (9th Cir. 2014), abrogated on other grounds by *Microsoft Corp. v. Baker*, 137 S. Ct. 1702 (2017) (quoting *Lectrodryer v. SeoulBank*, 77 Cal. App. 4th 723, 726 (2000)). "The person receiving the benefit is required to make restitution only if the circumstances are such that, as between the two individuals, it is *unjust* for the person to retain it." *Doe I v. Wal-Mart Stores*,

Inc., 572 F.3d 677, 684 (9th Cir. 2009) (internal quotation marks and citation omitted) (emphasis in original).

560. Apple is not entitled to recover on its unjust enrichment claim.

561. As an initial matter, it is not unjust for Epic to retain the alleged benefits that it received. As explained above, Apple benefited greatly from Epic's presence on iOS. (Findings of Fact ¶¶ 108-112.) "Exchanges where both parties benefit do not constitute unjust enrichment." *Howard v. Gap, Inc.*, No. C 06-06773 WHA, 2007 WL 164322, at *4 (N.D. Cal. Jan. 19, 2007) (New York law).

562. Independently, permitting Apple to recover on an unjust enrichment claim would undermine Congressional policy just as much as permitting Apple to recover on the express provisions of the DPLA and Schedule 2. (See § XIII.A.i above.) "As a general rule . . . a guilty party to an illegal contract cannot recover in quasi contract for the benefit conferred." *Ryan v. Mike-Ron Corp.*, 226 Cal. App. 2d 71, 75 (1964); see also *Toce*, 2018 WL 5994598, at *4 ("a party may not recover for that which cannot be recovered on a contract"); Restatement (Third) of Restitution and Unjust Enrichment § 32 (2011) ("Restitution will also be allowed, as necessary to prevent unjust enrichment, if the allowance of restitution will not defeat or frustrate the policy of the underlying prohibition.").

563. Further, even if the contractual provisions were lawful (which they are not), Apple still would not be entitled to double recovery for its unjust enrichment claim, as "restitution under an unjust enrichment pleading" are available "in lieu of contract damages". See *JPMorgan Chase Bank, N.A. v. Lewis*, No. 12-CV-2971-H-RBB, 2014 WL 12531091, at *7 (S.D. Cal. June 27, 2014).

564. Because the Court has found that the challenged provisions of the DPLA and Schedule 2 are unlawful, Apple cannot recover on its related unjust enrichment claim either. The Court denies relief on Count 3.

D. Because the Court upholds Epic's antitrust claims, Apple's declaratory judgment claim fails (Count 6).

565. Apple seeks a declaration that the Developer Agreement and DPLA are lawful contracts, that Apple's terminations of the Developer Agreement and DPLA with Epic were lawful, and that Apple has the contractual right to terminate the Developer Agreements and DPLAs with Epic's affiliates. (Legal Framework, App'x A (ECF No. 276-1) at 8-9; *see also* Apple's Answer (ECF No. 66) at pp. 61-63.)

566. Because Epic prevailed on its claims, Apple is not entitled to this declaration. Epic contends that the challenged provisions of the DPLA are unlawful. Because the Court agrees, Apple is not entitled to a declaration that the DPLA is lawful.

567. Similarly, Epic contends that Apple terminated the Developer Agreement and DPLA with Epic, and threatened to terminate the Developer Agreements and DPLAs with Epic's affiliates, in retaliation against Epic's decision to take a stand against Apple's monopolies. Because the Court agrees that this retaliation is unlawful, Apple is not entitled to a declaration that Apple's terminations of the Developer Agreement and DPLA with Epic were lawful or that Apple has the contractual right to terminate the Developer Agreements and DPLAs with Epic's affiliates.

568. The Court declines to grant the declaratory relief requested in Count 6.

E. Apple is not entitled to indemnification for actions between the contracting parties (Count 7).

569. Finally, based on Section 10 of the DPLA, Apple alleges that it “is entitled to indemnification from Epic, including recovery of attorneys’ fees and costs of defending this litigation and pursuing these Counterclaims”. (Apple’s Answer (ECF No. 66) at pp. 63-64.)

570. Section 10 of the DPLA provides that:

“To the extent permitted by applicable law, [Epic] agree[s] to indemnify and hold harmless, and upon Apple’s request, defend, Apple, its directors, officers, employees, independent contractors and agents (each an ‘Apple Indemnified Party’) from any and all claims, losses, liabilities, damages, taxes, expenses and costs, including without limitation, attorneys’ fees and court costs (collectively, ‘Losses’), incurred by an Apple Indemnified Party and arising from or related to any of the following . . . :

(i) [Epic’s] breach of any certification, covenant, obligation, representation or warranty in this Agreement, including Schedule 2 and Schedule 3 (if applicable); . . . or (vi) [Epic’s] use (including [Epic’s] Authorized Developers’ use) of the Apple Software or services, [Epic’s] Licensed Application Information, Pass Information, metadata, [Epic’s] Authorized Test Units, [Epic’s] Registered Devices, [Epic’s] Covered Products, or [Epic’s] development and distribution of any of the foregoing.” (PX-2619 (DPLA) § 10.)

571. “An indemnity agreement is to be interpreted according to the language and contents of the contract as well as the intention of the parties as indicated by the contract.”

Myers Bldg. Indus., Ltd. v. Interface Tech., Inc., 13 Cal. App. 4th 949, 968 (1993); *see also*

Herman Christensen & Sons, Inc. v. Paris Plastering Co., 61 Cal. App. 3d 237, 245 (1976)

(where the parties “have expressly contracted with respect to the duty to indemnify, the extent of that duty must be determined from the contract and not by reliance on the independent doctrine of equitable indemnity”). Such agreements “are construed under the same rules that govern the

interpretation of other contracts.” *Alki Partners, LP v. DB Fund Servs., LLC*, 4 Cal. App. 5th 574, 600 (2016).

572. Apple is not entitled to indemnification for two reasons.

573. *First*, Section 10 applies only to claims brought by third parties against Apple—not to claims between Epic and Apple. “Generally, an indemnification provision allows one party to recover costs incurred defending actions by third parties, not attorney fees incurred in an action between the parties to the contract.” *Alki*, 4 Cal. App. 5th at 600. “An indemnification clause in which one party promised to ‘indemnify’ the other from ‘any, all, and every claim’ which arises out of ‘the performance of the contract’ deals only with third party claims, and cannot support an award of attorney fees in an action for breach of contract between the parties to the agreement.” *Id.* at 601 (internal citation omitted).

574. Courts look to several indicators to distinguish third-party indemnification provisions from provisions for the award of attorney fees incurred in litigation between the parties to the contract. *Id.* at 600. The “key indicator” is “an express reference to indemnification”: “A clause that contains the words ‘indemnify’ and ‘hold harmless’ generally obligates the indemnitor to reimburse the indemnitee for any damages the indemnitee becomes obligated to pay third persons—that is, it relates to third party claims, not attorney fees incurred in a breach of contract between the parties to the indemnity agreement itself.” *Id.*

575. Section 10 states that Epic will “indemnify” Apple for “any and all . . . losses . . . arising from”, among other things, Epic’s “breach of any certification, covenant, obligation, representation or warranty in this Agreement”. (PX-2619 (DPLA) § 10.) Nothing in

Section 10 clearly states or indicates that the indemnification provision applies to claims asserted by one party against another.

576. Moreover, Section 10 provides that “upon Apple’s request”, Epic will “defend” Apple against the claims subject to indemnification. It would be nonsensical to interpret this to apply to claims brought by Epic, thereby requiring Epic to defend Apple against claims that Epic itself had brought.

577. Accordingly, Section 10 does not apply to an action between the two parties.

578. *Second*, even if the indemnification clause applied to intra-party disputes (which it does not), Section 10 should not be enforced in this case because such enforcement would be unconscionable.²³

579. The legal standard for unconscionability is discussed above. (*See* § XIII.A.iii above.)

580. If interpreted to cover intra-party disputes, the indemnification clause of the DPLA would be procedurally unconscionable because the DPLA is a contract of adhesion. (Findings of Fact § IV.A.)

²³ Apple argues that “Epic has waived any argument that the indemnification clause of the DPLA is substantively unconscionable.” (Apple’s 5/21/21 COL ¶ 817.) The Court disagrees. Epic pleaded the unconscionability defense in its Answer (ECF No. 106 at pp. 17-18), and Apple knew why Epic contended the indemnification clause was unconscionable well before trial (Legal Framework (ECF No. 276) at 121). Epic was not obligated at the pleading stage to explain all the bases on which each provision is unconscionable. *See Kohler v. Flava Enters., Inc.*, 779 F.3d 1016, 1019 (9th Cir. 2015) (holding that affirmative defense was not waived because “the ‘fair notice’ required by the pleading standards only requires describing the defense in ‘general terms’”).

581. Section 10 is substantively unconscionable. Courts have found indemnity clauses to be substantively unconscionable where, under the “bare language” of the clause, the defendant would be entitled to attorneys’ fees, costs and expenses and even the judgment amount from plaintiff even where plaintiff won suit against defendant. *See, e.g., Lennar Homes of Calif., Inc. v. Stephens*, 232 Cal. App. 4th. 673, 693 (2014). Under Apple’s reading, Section 10, requires Epic to pay regardless of whether Apple or Epic sues, and regardless of whether Apple or Epic prevails, because Apple will incur some amount of “[l]osses” in all scenarios. This is unconscionable. *See id.*

582. For the foregoing reasons, the Court denies relief on Count 7.

XIV. APPENDIX 1: SPECIFIC RELIEF

For the reasons provided in Epic's [Proposed] Conclusions of Law, Epic respectfully requests that the Court enter the permanent injunction set forth below.

Claims Concerning iOS App Distribution

The Court has found in favor of Epic on the following claims:

- Epic Count 1: Sherman Act § 2: Unlawful Monopoly Maintenance in the iOS App Distribution Market
- Epic Count 2: Sherman Act § 2: Denial of Essential Facility in the iOS App Distribution Market
- Epic Count 3: Sherman Act § 1: Unreasonable Restraints on Trade in the iOS App Distribution Market
- Epic Count 7: California Cartwright Act: Unreasonable Restraints of Trade in the iOS App Distribution Market
- Epic Count 10: California Unfair Competition Law (with respect to iOS app distribution)

To remedy Epic's injuries, the Court orders the following relief:

Apple is permanently enjoined from further violations of Section 1 and/or Section 2 of the Sherman Act, the Cartwright Act and/or the California Unfair Competition Law with respect to the iOS App Distribution Market and/or the App Store on the iOS platform;

Apple is permanently enjoined from restricting, prohibiting, impeding or deterring the distribution²⁴ of iOS apps through a distribution channel other than the App Store, including by:

²⁴ Distribution includes both supply of apps by developers and acquisition of apps by consumers unless otherwise specified.

- Restricting, prohibiting, impeding or deterring users of iOS devices, through technical, contractual, financial, or other means, from downloading, executing, installing and/or updating iOS apps and app stores from a distribution channel other than the App Store;
- Enforcing contractual provisions, guidelines or policies, or imposing technical restrictions or financial penalties, that (i) restrict, prohibit, impede or deter the distribution of iOS apps through a distribution channel other than the App Store or (ii) have the effect of impeding or deterring competition among app distributors (including competition between third party app distributors and the App Store);
- Conditioning access of developers to iOS on the pricing of their apps or in-app content on other platforms;
- Conditioning access of developers to the App Store on the pricing of their apps or in-app content on other platforms and/or on the pricing of their iOS apps or in-app content available through other distribution channels;
- Conditioning distribution through the App Store on exclusivity or on an agreement by a developer not to distribute an iOS app through other means; and
- Retaliating or threatening to retaliate against any developer on the basis of the developer's choice of iOS app distribution channel.

Apple is permanently enjoined from discriminating against or disadvantaging iOS app distribution through channels other than the App Store, including by:

1. Denying iOS app stores access to iOS functionality that the App Store has access to, including iOS functionality that assists in or is required for the downloading, execution, installation, updating and removal of apps;

2. Denying iOS apps that were downloaded through a distribution channel other than the App Store equivalent access to iOS functionality and/or features that iOS apps downloaded through the App Store have access to;
3. Deterring users from downloading, executing, installing and/or updating iOS apps from or through an app distribution channel other than the App Store, including by imposing “warning” screens or other user obstructions or deterrents on iOS apps distributed through channels other than the App Store that are not present for apps distributed through the App Store.

To remedy Apple’s past misconduct and its anti-competitive effects in the iOS App Distribution Market and other relevant markets, and in order to restore competition in the iOS App Distribution Market, the Court orders the following time-limited relief, which shall be effective from the date of this Order for a period of three (3) years:

4. Apple is enjoined from enforcing contractual provisions, guidelines or policies, or imposing technical restrictions, that restrict, prohibit, impede or deter distribution of iOS app stores through the App Store.

Nothing in this Order shall prohibit Apple from taking steps to prevent the distribution of malware.

Claims Concerning In-App Payment Processing

The Court has found in favor of Epic on the following claims:

- Epic Count 4: Sherman Act § 2: Unlawful Monopoly Maintenance in the iOS In-App Payment Solutions Market
- Epic Count 5: Sherman Act § 1: Unreasonable Restraints of Trade in the iOS In-App Payment Solutions Market

- Epic Count 6: Sherman Act § 1: Tying the App Store in the iOS App Distribution Market to In-App Purchase in the iOS In-App Payment Solutions Market
- Epic Count 8: California Cartwright Act: Unreasonable Restraints of Trade in the iOS In-App Payment Solutions Market
- Epic Count 9: California Cartwright Act: Tying the App Store in the iOS App Distribution Market to In-App Purchase in the iOS In-App Payment Solutions Market
- Epic Count 10: California Unfair Competition Law (with respect to iOS in-app payment processing)

To remedy Epic's injuries, the Court orders the following relief:

Apple is permanently enjoined from further violations of Section 1 and/or Section 2 of the Sherman Act, the Cartwright Act and/or the California Unfair Competition Law with respect to the iOS In-App Payment Solutions Market;

Apple is permanently enjoined from restricting, prohibiting, impeding or deterring the use of in-app payment processors other than Apple's In-App Purchase ("IAP"), including by:

- Rejecting iOS apps for distribution through the App Store or retaliating or threatening to retaliate against any developer of an iOS app on the basis of the developer's or the app's actual or intended integration of one or more non-IAP payment processors;
- Enforcing contractual provisions, guidelines or policies, or imposing technical restrictions or financial penalties, that (i) restrict, prohibit, impede or deter developers from integrating payment processors other than Apple's IAP into their apps for processing in-app purchases of in-app content or (ii) have the effect of

impeding or deterring competition among in-app payment processors; Apple is permanently enjoined from discriminating against payment processors other than Apple's IAP, iOS developers that use payment processors other than Apple's IAP, or iOS apps or app stores that use payment processors other than Apple's IAP, including by:

- Denying access to iOS apps or app stores that use payment processors other than Apple's IAP, to the same iOS functionality and/or features that apps using exclusively Apple's IAP for processing in-app purchases of in-app content have;
- Giving preferential treatment in search to iOS apps that exclusively use Apple's IAP; and

Apple is permanently enjoined from imposing a financial penalty or technical limitation on access to the iOS platform by iOS apps (including iOS app stores) that use payment processing solutions other than or in addition to Apple's IAP.

* * * *

Nothing in this Order shall prohibit Apple from seeking a modification of the Court's Order regarding the iOS In-App Payment Solutions Market on the basis of changed circumstances (*i.e.*, Apple's loss of monopoly power in the iOS App Distribution Market).

Anti-Circumvention

Apple is permanently enjoined from circumventing this Order by taking steps that violate the purpose, if not the terms, of this Order, including by imposing disincentives or providing incentives that are designed to, and have the effect of, making real competition in the iOS App Distribution Market and/or the iOS In-App Payment Solutions Market impracticable.

Anti-Retaliation

Apple is permanently enjoined from taking any retaliatory actions against Epic or any of its affiliates in connection with or based on Epic's filing of this Action, the August 2020 enablement of a direct payment option in *Fortnite*, or the steps Epic took to enable that option ("Prior Epic Actions"). For the avoidance of doubt, prohibited retaliatory actions include conduct by Apple that denies *Fortnite* access to Apple's App Store on the basis of such Prior Epic Actions.